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THE INSTALLATION AND OPERATION OF HULL ON 370S. PART 1. (U)
JAN 79 L P GABY, M A FRY, C E RHOADES
UNCLASSIFIED AFWL-TR-78-134-PT-1 SBIE-AD-E200 324 NL

1 OF 3
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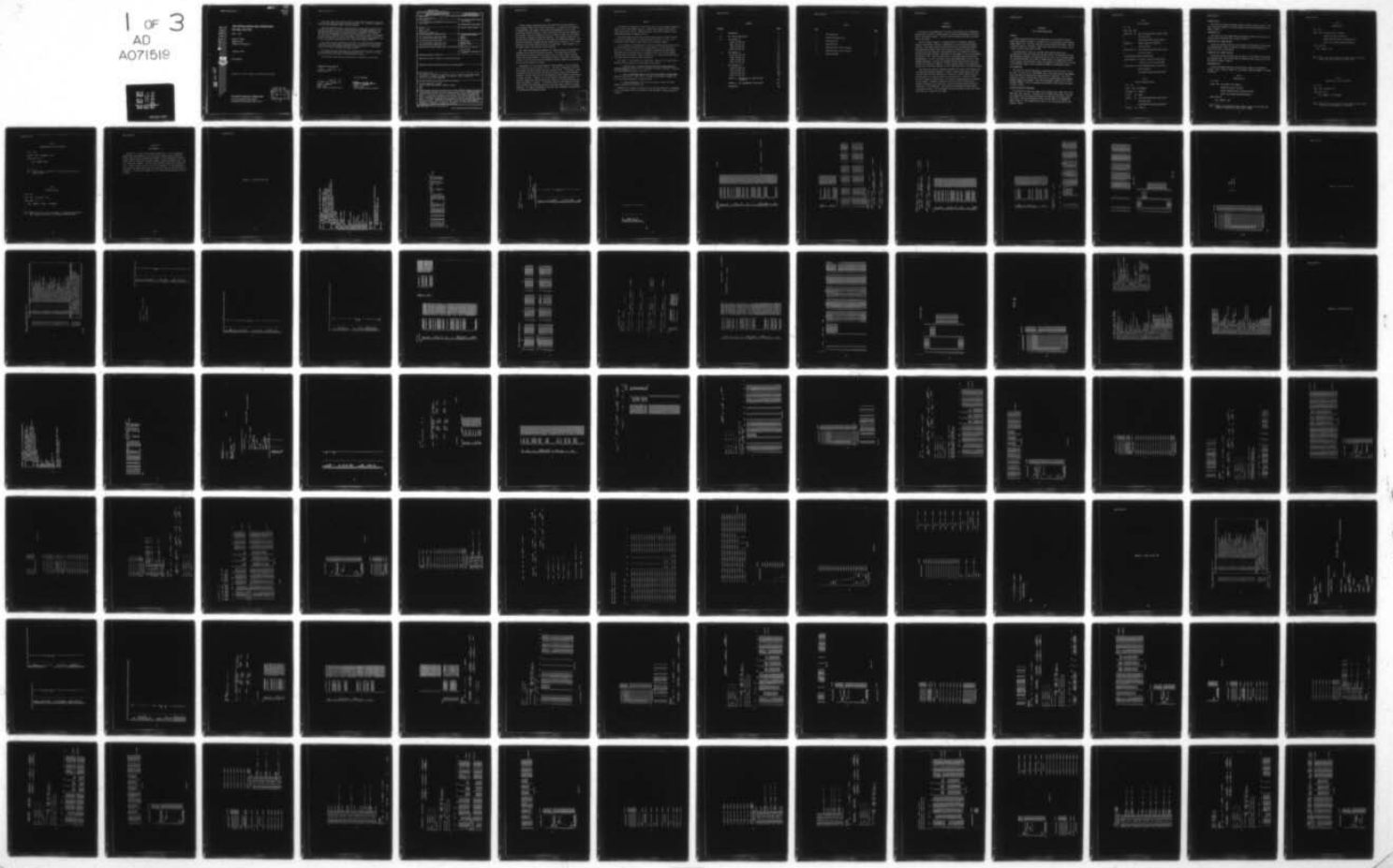

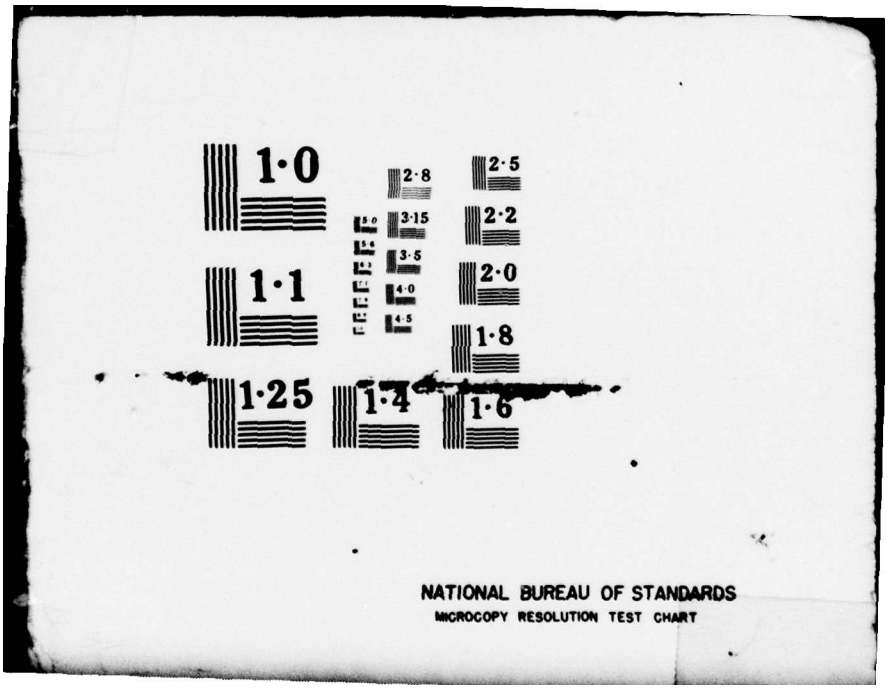
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NATIONAL BUREAU OF STANDARDS
MICROCOPY RESOLUTION TEST CHART

THE INSTALLATION AND OPERATION OF HULL ON 370s

Part 1 of 2

Lewis P. Gaby
Mark A. Fry
Clifford E. Rhoades, Jr.

January 1979

Final Report

Approved for public release; distribution unlimited.

AIR FORCE WEAPONS LABORATORY
Air Force Systems Command
Kirtland Air Force Base, NM 87117

This final report was prepared by the Air Force Weapons Laboratory, Kirtland Air Force Base, New Mexico under Job Order 88091822. Dr. Clifford E. Rhoades, Jr. (DYP) was the Laboratory Project Officer-in-Charge.

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This technical report has been reviewed and is approved for publication.

Clifford E. Rhoades, Jr.

CLIFFORD E. RHOADES, JR., PhD
Project Officer

FOR THE COMMANDER

Norman F. Roderick

NORMAN F. RODERICK
Major, USAF
Chief, Advanced Concepts Branch

Thomas W. Ciambrone

THOMAS W. CIAMBRONE
Colonel, USAF
Chief, Applied Physics Division

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This report is divided into two parts. Part 1 consists of the front matter and Sections I through IV, pages 1 through 258. Part 2 consists of Section V, pages 259 through 484.

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

Machine independent software
Elastic plastic hydrodynamic computer program
HULL
SAIL

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)* The HULL computer program is used to address problems in nuclear weapons effects and in armor penetration. Originally, HULL was written to run on the Air Force Weapons Laboratory CDC 6600s. To increase the number of installations which can successfully run HULL, the program has been modified to execute on System 370 compatible computers. This report describes the procedure for HULL installation under OS/VS operating systems. Operation of the HULL program on System 370 compatible equipment is discussed. In addition, the results of three sample problems are included for reference and comparison purposes.

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SUMMARY

The HULL computer program has been used extensively to study problems in nuclear weapons effects and in armor penetration. In addition to the equations of hydrodynamics, HULL models elastic-plastic phenomenology as well as non-equilibrium radiation diffusion. When originally written, HULL was designed for the CDC 6600. With the introduction of the CDC 7600 and Cyber 176, the program was modified to execute on these newer machines. The increasing popularity of the program has required conversion to IBM system 370 compatible equipment. The 360/370 architecture is perhaps the most widely used in the world. It is widely emulated in the United States and within the Soviet Bloc. Most noteworthy are the Amdahl 470/V7, the Itel AS6, and the IBM 3033.

This report describes the procedures for installing HULL on 370 compatible equipment running the OS/VS2 operating system. The reader begins with the standard HULL distribution tape and installs SAIL, the SAIL library, the HULL library and the HULL program. The operation of HULL is described in some detail so that a user with the aid of three companion technical reports can successfully set up and run problems of interest.

Because HULL is a very large program or, more properly, a set of programs, not all options could be checked in detail. The user is expected to write the plot package interface routines that are required by HULL. In addition, certain calculations may be sensitive to the default precision used by 370 compatible computers. We have found that only the equation-of-state needed to be converted to Double Precision. However, not all EOS materials have been converted. All users are expected to exercise professional caution in exploiting the HULL program for problems of interest. In addition, because of the complexity of HULL, minor changes to the operating system can have very drastic effects on program operation. All users are expected to have more than rudimentary sophistication in dealing with the operating system.

PREFACE

This manual was prepared as a part of the joint Air Force Armament Laboratory (AFATL) and Air Force Weapons Laboratory (AFWL) HULL computer program effort under Project 8809, Task 18, "Advanced Computer Simulation of Nuclear and Non-conventional Weapons and Weapons Effects."

This report applies to the elastic-plastic HULL system as written in-house at the AFATL by Major Daniel A. Matuska and Major Richard E. Durrett. All references in this report to HULL relate to this computer program.

It is a pleasure to acknowledge the assistance of Major Matuska whose technical contributions and advice made this report possible. We are thankful to Captain J. O. Skelton of the Air Force Armament Development and Test Center for arranging and providing funds for computer time at the Air Force Weapons Laboratory and at the Harry Diamond Laboratories. All calculations described in this report were performed at these laboratories.

This report is not intended to be read alone. Users of this report must be familiar with the contents of the following three reports:

1. The HULL Code: A Finite Difference Solution to the Equations of Continuum Mechanics, AFATL-TR-78-125 by Richard E. Durrett and Daniel A. Matuska, Air Force Armament Laboratory, Eglin AFB, FL.

2. SAIL, An Automated Approach to Software Development and Management, AFWL-TR-78-80 by Lewis P. Gaby, David H. Graham, and Clifford E. Rhoades, Jr., Air Force Weapons Laboratory, Kirtland AFB, NM.

3. HULL System Report, AFWL-TR-78-115 by Lewis P. Gaby, Air Force Weapons Laboratory, Kirtland AFB, NM.

Reference to a company or product name does not imply approval or recommendation of the product by the US Government to the exclusion of others that may be suitable.

CONTENTS

TABLES

SECTION I

INTRODUCTION

The study of the phenomenology of nuclear, nonconventional and conventional weapons effects requires an understanding of radiation hydrodynamics and elastic-plastic solid media response. The HULL computer program was written to provide these calculations.

The HULL computer program is a complete system for operating, updating, running, and plotting a variety of hydrodynamic or finite difference computer programs. The system includes an update routine which maintains and modifies the system source images, tape library routines, an executive routine which generates the source images for the executable code, and a module for plotting the resulting data calculated. Development of HULL began at the Air Force Weapons Laboratory in 1971. HULL was used mainly to investigate nuclear driven blast phenomenology. In 1975, a new phase of HULL development began at the Air Force Armament Laboratory. The code was extended into the elastic-plastic area with emphasis on solid media response. The HULL computer program is now operational on more than a half dozen computers in the United States and in the United Kingdom.

This manual provides the information necessary to install and to operate HULL on System 370 compatible computers. Section II, HULL System Installation, contains the details of the installation. Section III, IV and V display the test problems which can be used to check out the installation. Except for minor editorial changes to conserve space, the output is presented exactly as produced by the computer. Appendix A summarizes the intent of this research while Appendix B provides a quick overview of what was learned during the process of moving HULL to the System 370. The preface cites two reports, which must be understood in detail. The bibliography contains references to other calculations which may be of interest to the reader.

SECTION II

HULL SYSTEM INSTALLATION

OVERVIEW

The HULL installation tape for the IBM system is an unlabeled nine-track EBCDIC tape written at 800 bpi. It contains six files that have a fixed blocked format (RECFM = FB). The first four have a record length of 80 (LRECL = 80) and a blocking factor of 10 (BLKSIZE = 800), while the two last files have a record length of 120 with block sizes of 1200.

The installation of HULL on a new IBM system requires seven steps: (1) generation of SAIL and creation of the SAIL library, (2) obtaining the HULL/SAIL execution procedures, (3) converting the SAIL file of SAIL to packed format, (4) converting the SAIL file of HULL to packed format, (5) generating the SAIL utility routine in the SAIL/HULL library, (6) generating the HULL utility routines in the SAIL/HULL library, and (7) generating PLANK in the SAIL/HULL library.

SAIL GENERATION

The source for the SAIL generation is contained on the first three files of the tape. The first file is the FORTRAN source, the second contains the assembly source and the third contains the linkage editorial directives. The initial generation of SAIL is the SAIL/HULL library and is accomplished by the standard assembly compilation procedure. ASMC and the FORTRAN H compiler and link edit procedure FORTHCL. The JCL to generate the SAIL/HULL library named SAIL.HULLIB is shown in table 1.

EXTRACTING EXECUTION PROCEDURES

The fourth file on the tape contains the procedures SAIL, SGEN, SLIB, HLIB, PGEN, KEEL, HULL, and PULL. Procedures SAIL and SGEN are described in the SAIL users manual while the remaining procedures are described in the HULL system users guide. They may be punched to cards using the IBM utility IEBGENER as shown in table 2. The procedure may be used in line and may be placed in the procedure library.

Table 1

SAIL GENERATION

```
//**  JOB . . .
//ASM  EXEC  ASMC
//ASM.SYSIN   DD   UNIT= TAPE9,VOL=SER=HULL,LABEL=(2,NL),
//                 DISP=(OLD,PASS),
//                 DCB=RECFM=FB,LRECL=80,BLKSIZE=800)
//COMP EXEC        FORTHCL,PARM.FORT='NAME=SAIL',
//                 PARM.LKED='OVLY'
//FORT.SYSIN  DD   UNIT=TAPE9,VOL=SER=HULL,LABEL=(1,NC),
//                 DISP=(OLD,PASS),
//DCB=(RECFM=FB,LRECL=80,BLKSIZE=800)
//LKED.SYSLMOD  DD  DSC=SAIL.HULLIB,DISP=(NEW,CATLG),
//                  SPACE=(CYL,(10,10,10)UNIT=SYSDA
//LKED.SYSIN  DD  UNIT=TAPE9,VOL=SER=HULL,LABEL=3,NL),
                  DISP=(OLD,KEEP),
                  DCB=(RECFM=FB,LRECL=80,BLKSIZE=800)
```

Table 2

PUNCHING PROCEDURE DECKS

```
//***  JOB-...
//COPY   EXEC  PGM=IEBGENER
//SYSPRINT  DD   SYSOUT=A
//SYSIN     DD   DUMMY
//SYSUT1    DD   UNIT=TAPE9,VOL=SER=HULL,LABEL=(4,NL)
//               DISP=(OLD,KEEP),
//               DCB=(RECFM=FB,LRECL=80,BLKSIZE=800)
//SYSUT2    DD   SYSOUT=B
```

CONVERTING SAIL

The fifth file contains the coded format of the SAIL library of SAIL. To be used it must be converted to a binary packed format using the procedure SAIL as shown in table 3.

CONVERTING HULL

The sixth file is the coded format of the HULL file which also must be converted using the procedure SAIL as shown in table 4.

GENERATING SAIL LIBRARY ROUTINE

The utility routines from SAIL must be added to the SAIL/HULL library using the procedure SLIB. Table 5 shows the JCL which will add the routines to a library on a data set SAIL.HULLIB.

GENERATING HULL LIBRARY ROUTINES

The utility routines from HULL must be added to the SAIL/HULL library using the procedure HLIB. The JCL which adds the routines to the library on data set SAIL.HULLIB is shown in table 6.

GENERATING PLANK

Finally the program PLANK must be generated and added to the SAIL/HULL library. Table 7 shows an example JCL using PGEN to generate PLANK on a library SAIL.HULLIB.

Table 3

CONVERTING SAIL

```
///*** JOB...
//COPY  EXEC  SAIL,GEND=,FILO=5,LABO=NL,
              OLDVOL=HULL,OLDDS='(OLD,KEEP',
              OLDDCB='(RECFM=FB,LRECL=120,BLKSIZE=1200)',
              GENN='.V58',NEWDUM=,NEWU=SYSDA,NEW=SAIL
//SAIL.INPUT DD
       SAIL  CONVERT  COPY
```

Note: Library is SAIL.HULLIB and SAIL library of SAIL is on SAIL.SAIL.V58 stored on a system direct access device (SYSDA).

Table 4

CONVERTING HULL

```
//***  JOB...
//COPY  EXEC  SAIL,LENO=,FILO=6, LABO=NL,
              OLDVOL=HULL,OLDDS='(OLD,KEEP)',
              OLDDLB='(RELFM=FB,LRECL=120,BLKSIZE=1200)',
              GENN='.V105',NEWDUM=,NEWJ=SYSDA,NEW=HULL
//SAIL.INPUT DD*
     SAIL  CONVERT  COPY
/*
```

Note: Library is on SAIL.HULLIB.SAIL library of HULL is on system direct access device SYSDA) as SAIL.HULL.V105.

Table 5

GENERATING SAIL UTILITY ROUTINES

```
//***  JOB...
//GEN  EXEC  HLIB,GENO='.V58'
//SAIL.INPUT  DD *
      SAIL  PROGRAM  LIB  ENDPROGRAM
/*
```

Note: Library to be used and update is SAIL.HULLIB and SAIL library file of SAIL is cataloged as SAIL.SAIL.V58.

Table 6

GENERATING HULL UTILITY ROUTINES

```
//***   JOB...
//PLANK   EXEC   PGEN,GENO='.V105'
//SAIL.INPUT   DD   *
      SAIL  PROGRAM  PLANK
/*
```

Note: Object library is SAIL.HULLIB. SAIL library file of HULL is SAIL.HULL.V105.

Table 7

GENERATING PLANK

```
///***  JOB...
//GEN   EXEC   HLIB,GENO='.V105'
//SAIL.INPUT   DD  *
     SAIL  PROGRAM   LIBRARY   ENDPROGRAM
/*
```

Note: Object library to be used and updated is cataloged as SAIL.HULLIB. SAIL system library of HULL is cataloged as SAIL.HULL.V105.

SECTION III

TEST PROBLEM 1.2

Problem 1.2 is a small test problem with 560 zones. It is a cylindrical shaped copper rod impacting a thin steel plate at approximately 10,000 ft/s. Options selected for this problem were ATMOS=5, constant atmosphere, STRESS=1, elastic-plastic formulation included, FLUXER=3, volume and energy fluxes. Zone sizes were 0.25 cm square; 118 cycles were completed advancing the problem to 16 μs. Dumps at cycle 0, 20, 27, and 118 are presented. In this penetration simulation, the copper rod was kept stationary and the steel plate was moved at 10,000 ft/s. By cycle 118, problem time 16 μs the plate has moved to the top of the mesh.

PROBLEM 1.2 SYSTEM 370 KEEL RUN

```
//AF2001K JOB (AF2001,,5),'KEEL RUN',MSGCLASS=H,CLASS=B,
//         NOTIFY=AF2001
//KEEL EXEC KEEL,GENO='.V105',FPARM='NOSOURCE,TERM',
//       PS1='SYSOUT=H,HOLD=YES',PS2='SYSOUT=H,HOLD=YES',
//       FP1='SYSOUT=H,HOLD=YES',LP1='SYSOUT=H,HOLD=YES',
//       KP1='SYSOUT=H,HOLD=YES',KTIME=1,LIBPRE='AF2001.',
//       OLDPRE='AF2001.',PP1='SYSOUT=H,HOLD=YES',PTIME='(0,10)'
//KEEL.DATA DD  DSN=AF2001.HULL.PROB1P2,UNIT=SYSDA,DISP=(NEW,CATLG),
//     DCB=(RECFM=VBS,LRECL=7220,BLKSIZE=7224),
//     SPACE=(CYL,(20,20))
//KEEL.STATION  DD  DUMMY
//KEEL.INPUT DD  *
KEEL PROB=1.2
STRESS=1 STRAIN=1 ATMOS=5
IMAX=20 JMAX=28
EOS=6 MM=3 AIR=1 FE=2 CU=3
FLUXER=3
HEADER
CU PENETRATOR
MESH XMAX=5 Y0=-2 YMAX=5
GENERATE
PACKAGE AIR V 3.E5
RECTANGLE Y2=-1
PACKAGE FE V=3.E5
RECTANGLE Y1=-1 Y2=0
PACKAGE AIR
RECTANGLE Y1=0
RECTANGLE X2=1 Y1=0 Y2=4
PACKAGE CU
RECTANGLE X2=1 Y1=0 Y2=4
/*
//SAIL.INPUT  DD  *
 SAIL LINENO
/*
//FORT.SYSTERM DD DSN=AF2001.KEELT.OUTLIST,DISP=(NEW,CATLG),
//     UNIT=SYSDA,SPACE=(CYL,(3,3)),
//     DCB=(RECFM=FB,LRECL=133,BLKSIZE=1330)
//
END OF DATA
```

```
                                                  J E S 2   J O B   L O G
10.38.12 JOB  109  IEF677I WARNING MESSAGE(S) FOR JOB AF2001K  ISSUED
10.38.12 JOB  109  $HASP373 AF2001K  STARTED - INIT  3 - CLASS B - SYS A168
10.38.18 JOB  109  AF2001K  KEEL     10:38:12      6      0.24  S000
10.38.31 JOB  109  AF2001K  PLANK    10:38:20     11      0.74  S000
10.50.07 JOB  109  AF2001K  SAIL     10:38:31    696    109.09  S000
10.54.38 JOB  109  AF2001K  FORT     10:50:08    270     19.00  S004
10.55.17 JOB  109  AF2001K  LKED     10:54:41     36      2.19  S000
10.55.46 JOB  109  AF2001K  GO       10:55:17     29      3.61  S000
10.55.48 JOB  109  $HASP395 AF2001K  ENDED

OUT
```

GENERATING KEEL
DISK VERSION
KEEL RUN

EQUATION OF STATE -
SOLIDS - NO STRENGTH
ATMOSPHERE -
CONSTANT
VOLUME AND ENERGY FLUXING
THE FOLLOWING OPTIONS WERE DEFINED BY PLANK.

ATMOS	=	5
BURN	=	0
CODE	=	1
DIMEN	=	2
EOS	=	6
GEOM	=	2
HOT	=	0
IMAX	=	20
ISLAND	=	0
JMAX	=	28
KMAX	=	1
LBUFA	=	0
LBUFB	=	0
MAGFLD	=	0
METHOD	=	2
NH	=	20
NHIC	=	1600
NM	=	3
NOP	=	1000
NHIST	=	6
NPLPB	=	2
NPP	=	3
NROWPB	=	4
NSTN	=	0
NVARST	=	16
RAD	=	0
REZONE	=	1
STRESS	=	1
SURF	=	0
SW	=	6
SWX	=	0
VISC	=	0
LAMB	=	0
BBOUND	=	0

```
LBOUND  =       0
KEEL    =       0
PULL    =       0
VOIDS   =       0
FLUXER  =       3
DEPOS   =       0
FAIL    =       0
STRAIN  =       1
WORK    =       0
FIREIN  =       0
MAT     =       3
AIR     =       1
FE      =       2
CU      =       3

OUT
```

KEEL OUTPUT
CU PENETRATOR 00002250
ZBLK

PROB	1.19999980926514D+00	4113333300000000
ATMOS	5.00000000000000D+00	4150000000000000
BREF	0.0	0000000000000000
CODE	1.00000000000000D+00	4110000000000000
COLD	0.00000514755759D-79	0000000100000000
CYCLE	0.0	0000000000000000
DIMEN	2.00000000000000D+00	4120000000000000
DT	1.00000008274037D-08	3A2AF31E00000000
ELC	0.0	0000000000000000
EOS	6.00000000000000D+00	4160000000000000
ETH	0.0	0000000000000000
EXPAND	5.00009007450581D-02	3FCCCCCD00000000
FAIL	0.0	0000000000000000
FLUXER	3.00000000000000D+00	4130000000000000
GEOM	2.00000000000000D+00	4120000000000000
IMAX	2.00000000000000D+01	4214000000000000
IQ	1.90000000000000D+01	4213000000000000
ISLAND	0.0	0000000000000000
JMAX	2.80000000000000D+01	421C000000000000
JQ	2.70000000000000D+01	421B000000000000
HOB	0.0	0000000000000000
LREF	0.00000514755759D-79	0000000100000000
METHOD	2.00000000000000D+00	4120000000000000
MLC	0.0	0000000000000000
MTH =	0.0	0000000000000000
NH	2.00000000000000D+01	4214000000000000
NHIC	1.60000000000000D+03	4364000000000000
NHIST	6.00000000000000D+00	4160000000000000
NM	3.00000000000000D+00	4130000000000000
NOP	0.0	0000000000000000
NPP	3.00000000000000D+00	4130000000000000
NROWPB	4.00000000000000D+00	4140000000000000
PTSTOP	6.00000000000000D+02	4325800000000000
RADLOS	0.0	0000000000000000 == REZONE 1.00000000000000D+00 4110000000000000
RREF	0.0	0000000000000000
STABF	5.00000000000000D-01	4080000000000000
STRAIN	1.00000000000000D+00	4110000000000000
STRESS	1.00000000000000D+00	4110000000000000
SUME	0.0	0000000000000000
T	0.0	0000000000000000
TERAD	0.0	0000000000000000
TLC	0.0	0000000000000000
TREF	0.0	0000000000000000
TTIME	0.0	0000000000000000
TTSTOP	1.00000000000000D+02	4264000000000000
UREZ	1.00000000000000D+01	41A0000000000000

```
VISC            0.0                         0000000000000000
VREZ            1.00000000000000D+01        41A0000000000000
VOIDS           0.0                         0000000000000000
WORK            0.0                         0000000000000000
X1              4.00000000000000D+00        4140000000000000
X2             -1.00000000000000D+00        C110000000000000
X03             0.0                         0000000000000000
Y1              5.00000000000000D+00        4150000000000000
Y2              2.30000000000000D+01        4217000000000000
YGND            0.0                         0000000000000000
YIELD           0.0                         0000000000000000
AIR             1.00000000000000D+00        4110000000000000
CU              3.00000000000000D+00        4130000000000000
FE              2.00000000000000D+00        4120000000000000
   MESH INCREMENTS AND COORDINATES

I          DX              X          I          DX              X          I          DX              X
 X0=  0.0
 1  2.50000000E-01  2.50000000E-01     2  2.50000000E-01  5.00000000E-01     3  2.50000000E-01  7.50000000E-01
 4  2.50000000E-01  1.00000000E+00     5  2.50000000E-01  1.25000000E+00     6  2.50000000E-01  1.50000000E+00
 7  2.50000000E-01  1.75000000E+00     8  2.50000000E-01  2.00000000E+00     9  2.50000000E-01  2.25000000E+00
10  2.50000000E-01  2.50000000E+00    11  2.50000000E-01  2.75000000E+00    12  2.50000000E-01  3.00000000E+00
13  2.50000000E-01  3.25000000E+00    14  2.50000000E-01  3.50000000E+00    15  2.50000000E-01  3.75000000E+00
16  2.50000000E-01  4.00000000E+00    17  2.50000000E-01  4.25000000E+00    18  2.50000000E-01  4.50000000E+00
19  2.50000000E-01  4.75000000E+00    20  2.50000000E-01  5.00000000E+00
J          DY              Y          J          DY              Y          J          DY              Y
 Y0= -2.00000095E+00
 1  2.50000060E-01 -1.75000000E+00     2  2.50000060E-01 -1.49999905E+00     3  2.50000060E-01 -1.24999809E+00
 4  2.50000060E-01 -9.99998033E-01     5  2.50000060E-01 -7.49997973E-01     6  2.50000060E-01 -4.99997914E-01
 7  2.50000060E-01 -2.49997854E-01     8  2.50000060E-01  2.20537186E-06     9  2.50000060E-01  2.50002265E-01
10  2.50000060E-01  5.00002325E-01    11  2.50000060E-01  7.50002384E-01    12  2.50000060E-01  1.00000191E+00
13  2.50000060E-01  1.25000191E+00    14  2.50000060E-01  1.50000191E+00    15  2.50000060E-01  1.75000191E+00
16  2.50000060E-01  2.00000191E+00    17  2.50000060E-01  2.25000191E+00    18  2.50000060E-01  2.50000191E+00
19  2.50000060E-01  2.75000191E+00    20  2.50000060E-01  3.00000191E+00    21  2.50000060E-01  3.25000191E+00
22  2.50000060E-01  3.50000191E+00    23  2.50000060E-01  3.75000191E+00    24  2.50000060E-01  4.00000191E+00
25  2.50000060E-01  4.25000191E+00    26  2.50000060E-01  4.50000191E+00    27  2.50000060E-01  4.75000191E+00
28  2.50000060E-01  5.00000191E+00
     GENERATING PROBLEM    1.2000
 DEFAULT WILL BE
GENERATE A CIRCLE   OF MATERIAL  1
        XC =  0.0           YC =  0.0          RADIUS =  0.0
   AIR     =  1
GENERATE A RECTANGL OF MATERIAL  1
        X1 =  0.0           X2 =  5.0000000E+00 Y1 = -2.0000010E+00 Y2 = -1.0000000E+00
    9.620315E-02 GMS   4.526023E+09 ERGS INSERTED AS MATERIAL  1


   FE      =  2
GENERATE A RECTANGL OF MATERIAL  2
        X1 =  0.0           X2 =  5.0000000E+00 Y1 = -1.0000000E+00 Y2 =  0.0
    6.172676E+02 GMS   2.855992E+13 ERGS INSERTED AS MATERIAL  2
```

```
    AIR      =  1
GENERATE A RECTANGL OF MATERIAL  1
         X1 =  0.0            X2 =  5.0000000E+00 Y1 =  0.0            Y2 =  5.0000019E+00
    DELETE A   RECTANGL
         X1 =  0.0            X2 =  1.0000000E+00 Y1 =  0.0            Y2 =  4.0000010E+00
     4.655850E-01 GMS   9.515241E+08 ERGS INSERTED AS MATERIAL  1


    CU       =  3
GENERATE A RECTANGL OF MATERIAL  3
         X1 =  0.0            X2 =  1.0000000E+00 Y1 =  0.0            Y2 =  4.0000010E+00
     1.118370E+02 GMS   1.267456E+11 ERGS INSERTED AS MATERIAL  3


ZBLK
    PROB          1.19999980926514D+00     4113333300000000
    ATMOS         5.00000000000000D+00     4150000000000000
    BREF          0.0                      0000000000000000
    CODE          1.00000000000000D+00     4110000000000000
    COLD          0.00000514755759D-79     0000000100000000
    CYCLE         0.0                      0000000000000000
    DIMEN         2.00000000000000D+00     4120000000000000
    DT            1.00000008274037D-08     3A2AF31E00000000
    ELC           0.0                      0000000000000000
    EOS           6.00000000000000D+00     4160000000000000
    ETH           0.0                      0000000000000000
    EXPAND        5.00000007450581D-02     3FCCCCCD00000000
    FAIL          0.0                      0000000000000000
    FLUXER        3.00000000000000D+00     4130000000000000
    GEOM          2.00000000000000D+00     4120000000000000
    IMAX          2.00000000000000D+01     4214000000000000
    IQ            1.90000000000000D+01     4213000000000000
    ISLAND        0.0                      0000000000000000
    JMAX          2.80000000000000D+01     421C000000000000
    JQ            2.70000000000000D+01     421B000000000000
    HOB           0.0                      0000000000000000
    LREF          0.00000514755759D-79     0000000100000000
    METHOD        2.00000000000000D+00     4120000000000000
    MLC           0.0                      0000000000000000
    MTH           0.0                      0000000000000000
    NH            2.00000000000000D+01     4214000000000000
    NHIC          1.60000000000000D+03     4364000000000000
    NHIST         6.00000000000000D+00     4160000000000000
    NM            3.00000000000000D+00     4130000000000000
    NOP           0.0                      0000000000000000
    NPP           3.00000000000000D+00     4130000000000000
    NROUP         4.00000000000000D+00     4140000000000000
    PTSTOP        6.00000000000000D+02     4325800000000000
    RADLOS        0.0                      0000000000000000
```

REZONE	1.000000000000000D+00	4110000000000000
RREF	0.0	0000000000000000
STABF	5.000000000000000D-01	4080000000000000
STRAIN	1.000000000000000D+00	4110000000000000
STRESS	1.000000000000000D+00	4110000000000000
SUME	0.0	0000000000000000
T	0.0	0000000000000000
TERAD	0.0	0000000000000000
TLC	0.0	0000000000000000
TREF	0.0	0000000000000000
TTIME	0.0	0000000000000000
TTSTOP	1.000000000000000D+02	4264000000000000
UREZ	1.000000000000000D+01	41A0000000000000
VISC	0.0	0000000000000000
VREZ	1.000000000000000D+01	41A0000000000000
VOIDS	0.0	0000000000000000
WORK	0.0	0000000000000000
X1	4.000000000000000D+00	4140000000000000
X2	-1.000000000000000D+00	C110000000000000
XOB	0.0	0000000000000000
Y1	5.000000000000000D+00	4150000000000000
Y2	2.300000000000000D+01	4217000000000000
YGND	0.0	0000000000000000
YIELD	0.0	0000000000000000
AIR	1.000000000000000D+00	4110000000000000
CU	3.000000000000000D+00	4130000000000000
FE	2.000000000000000D+00	4120000000000000

INDIVIDUAL MASS SUMS
5.618618E-01 6.173164E+02 1.118401E+02

I= 1 X(I)= 0.250 DX(I)= 0.250

J	U	V	AIX	RHO	AMX	DY	Y
1	0.0	3.00000187E+05	2.04397363E+09	1.22499629E-03	6.01318898E-05	2.50000060E-01	-1.75000000E+00
2	0.0	3.00000187E+05	2.04397363E+09	1.22499629E-03	6.01318898E-05	2.50000060E-01	-1.49999905E+00
3	0.0	3.00000187E+05	2.04397363E+09	1.22499629E-03	6.01318898E-05	2.50000060E-01	-1.24999809E+00
4	0.0	3.00000187E+05	2.04397363E+09	1.22499629E-03	6.01318898E-05	2.50000060E-01	-9.99998033E-01
5	0.0	2.99999750E+05	1.26824038E+09	7.85998154E+00	3.85826111E-01	2.50000060E-01	-7.49997973E-01
6	0.0	2.99999750E+05	1.26824038E+09	7.85998154E+00	3.85826111E-01	2.50000060E-01	-4.99997914E-01
7	0.0	2.99999750E+05	1.26824038E+09	7.85998154E+00	3.85826111E-01	2.50000060E-01	-2.49997854E-01
8	0.0	2.99999750E+05	1.26824038E+09	7.85998154E+00	3.85826111E-01	2.50000060E-01	2.20537186E-06
9	0.0	0.0	1.13335680E+09	8.89997673E+00	4.36876774E-01	2.50000060E-01	2.50002265E-01
10	0.0	0.0	1.13335680E+09	8.89997673E+00	4.36876774E-01	2.50000060E-01	5.00002325E-01
11	0.0	0.0	1.13335680E+09	8.89997673E+00	4.36876774E-01	2.50000060E-01	7.50002384E-01
12	0.0	0.0	1.13335680E+09	8.89997673E+00	4.36876774E-01	2.50000060E-01	1.00000191E+00

13	0.0	0.0	1.13335680E+09	8.89997673E+00	4.36876774E-01	2.50000060E-01	1.25000191E+00
14	0.0	0.0	1.13335680E+09	8.89997673E+00	4.36876774E-01	2.50000060E-01	1.50000191E+00
15	0.0	0.0	1.13335680E+09	8.89997673E+00	4.36876774E-01	2.50000060E-01	1.75000191E+00
16	0.0	0.0	1.13335680E+09	8.89997673E+00	4.36876774E-01	2.50000060E-01	2.00000191E+00
17	0.0	0.0	1.13335680E+09	8.89997673E+00	4.36876774E-01	2.50000060E-01	2.25000191E+00
18	0.0	0.0	1.13335680E+09	8.89997673E+00	4.36876774E-01	2.50000060E-01	2.50000191E+00
19	0.0	0.0	1.13335680E+09	8.89997673E+00	4.36876774E-01	2.50000060E-01	2.75000191E+00
20	0.0	0.0	1.13335680E+09	8.89997673E+00	4.36876774E-01	2.50000060E-01	3.00000191E+00
21	0.0	0.0	1.13335680E+09	8.89997673E+00	4.36876774E-01	2.50000060E-01	3.25000191E+00
22	0.0	0.0	1.13335680E+09	8.89997673E+00	4.36876774E-01	2.50000060E-01	3.50000191E+00
23	0.0	0.0	1.13335680E+09	8.89997673E+00	4.36876774E-01	2.50000060E-01	3.75000191E+00
24	0.0	0.0	1.13335680E+09	8.89997673E+00	4.36876774E-01	2.50000060E-01	4.00000191E+00
25	0.0	0.0	2.04399949E+09	1.22499629E-03	6.01318898E-05	2.50000060E-01	4.25000191E+00
26	0.0	0.0	2.04399949E+09	1.22499629E-03	6.01318898E-05	2.50000060E-01	4.50000191E+00
27	0.0	0.0	2.04399949E+09	1.22499629E-03	6.01318898E-05	2.50000060E-01	4.75000191E+00
28	0.0	0.0	2.04399949E+09	1.22499629E-03	6.01318898E-05	2.50000060E-01	5.00000191E+00

MATERIAL MASSES

J	1	2	3
1	6.01318898E-05	0.0	0.0
2	6.01318898E-05	0.0	0.0
3	6.01318898E-05	0.0	0.0
4	6.01318898E-05	0.0	0.0
5	0.0	3.85826111E-01	0.0
6	0.0	3.85826111E-01	0.0
7	0.0	3.85826111E-01	0.0
8	0.0	3.85826111E-01	0.0
9	0.0	0.0	4.36876774E-01
10	0.0	0.0	4.36876774E-01
11	0.0	0.0	4.36876774E-01
12	0.0	0.0	4.36876774E-01
13	0.0	0.0	4.36876774E-01
14	0.0	0.0	4.36876774E-01
15	0.0	0.0	4.36876774E-01
16	0.0	0.0	4.36876774E-01
17	0.0	0.0	4.36876774E-01
18	0.0	0.0	4.36876774E-01
19	0.0	0.0	4.36876774E-01
20	0.0	0.0	4.36876774E-01
21	0.0	0.0	4.36876774E-01
22	0.0	0.0	4.36876774E-01
23	0.0	0.0	4.36876774E-01
24	0.0	0.0	4.36876774E-01
25	6.01318898E-05	0.0	0.0
26	6.01318898E-05	0.0	0.0
27	6.01318898E-05	0.0	0.0
28	6.01318898E-05	0.0	0.0

MATERIAL MAP
(1- 20)

```
          1         2
                                ALTITUDE
  12345678901234567890
                                METERS
 1 ++++++++++++++++++++ -1.750E-02
 2 ++++++++++++++++++++ -1.500E-02
 3 ++++++++++++++++++++ -1.250E-02
 4 ++++++++++++++++++++ -1.000E-02
 5 XXXXXXXXXXXXXXXXXXX -7.500E-03
 6 XXXXXXXXXXXXXXXXXXX -5.000E-03
 7 XXXXXXXXXXXXXXXXXXX -2.500E-03
 8 XXXXXXXXXXXXXXXXXXX  2.205E-08
 9 OOOO++++++++++++++++  2.500E-03
10 OOOO++++++++++++++++  5.000E-03
11 OOOO++++++++++++++++  7.500E-03
12 OOOO++++++++++++++++  1.000E-02
13 OOOO++++++++++++++++  1.250E-02
14 OOOO++++++++++++++++  1.500E-02
15 OOOO++++++++++++++++  1.750E-02
16 OOOO++++++++++++++++  2.000E-02
17 OOOO++++++++++++++++  2.250E-02
18 OOOO++++++++++++++++  2.500E-02
19 OOOO++++++++++++++++  2.750E-02
20 OOOO++++++++++++++++  3.000E-02
21 OOOO++++++++++++++++  3.250E-02
22 OOOO++++++++++++++++  3.500E-02
23 OOOO++++++++++++++++  3.750E-02
24 OOOO++++++++++++++++  4.000E-02
25 ++++++++++++++++++++  4.250E-02
26 ++++++++++++++++++++  4.500E-02
27 ++++++++++++++++++++  4.750E-02
28 ++++++++++++++++++++  5.000E-02
  12345678901234567890
          1         2

OUT
```

+ - AIR
X - STEEL
O - COPPER

PROBLEM 1.2 CYBER 176 KEEL RUN

```
BATCH       CREATED 08/18/78  TODAY IS 08/21/78
  AUTOMATIC BULLETIN TO BATCH JOBS
+
```

	SYSBULL	CONTENTS
8/18/78	STATUS	AVAILABILITY STATUS OF ALL SYSTEMS
8/ 9/78	MEMMGT	CM AND ECS FIELD MANAGEMENT
7/31/78	NASTRAN	INFORMATION FOR USERS OF NASTRAN
7/10/78	CONTACT	WHO TO CONTACT ABOUT COMPUTER PROBLEMS
7/14/78	MODS	FEATURES ADDED TO CDC NOS/BE
7/14/78	CMECMGT	CM AND ECS FIELD LENGTH MANAGEMENT
6/23/78	FLECS	STRUCTURED PROGRAMMING PRE-PROCESSOR FOR FTN
6/20/78	LETTER	AFWL COMPUTER CENTER NEWSLETTER
6/14/78	ASPLIB	AFWL COMMON MATH LIBRARIES
5/16/78	CLASS	CLASSES FOR USERS OF AFWL COMPUTER CENTER
5/ 8/78	ACCESS	HOW TO OBTAIN AN AFWL/KAFB COMPUTER ACCOUNT
5/ 4/78	CONFIG	SYSTEMS CONFIGURATION
5/ 4/78	EXPDITE	AFWR CUSTOMER SERVICE (EXPEDITOR)
5/ 1/78	PRIORTY	JOB CARD PRIORITY CODES
4/24/78	BILLING	AFWL COMPUTER BILLING INFORMATION
4/21/78	DIALUP	COMPUTER DIALUP PHONE NUMBERS
4/19/78	INTRO	BASIC INTRODUCTION TO KAFB COMPUTER CENTER
4/18/78	DUMPS	STANDARD PROCEDURES FOR ERROR DUMPS
4/14/78	TITLE	MICROFICHE VISUAL TITLE GENERATION
4/11/78	REQUEST	STANDARD PROCEDURES FOR REQUESTING TAPES
4/ 6/78	PLOT	DEVICE INDEPENDENT PLOT SYSTEM -METAPLOT-
3/31/78	ACCOUNT	ACCOUNT CARD FORMAT.
3/30/78	PFRULES	LOCAL RULES FOR CATALOGING FILES
3/30/78	BACKUP	PERMANENT FILE BACKUP PROCEDURES
3/30/78	PRMFILE	PERM FILE ACCOUNTING AND BACKUP SYSTEMS
3/ 9/78	LABEL	AFWL LABELLED TAPE PROCESSING
3/ 9/78	FR80	200 SIMULATION VIA FR80
3/ 9/78	COMPILE	FTN COMPILER CHANGES AND RELEASES
3/ 8/78	AFSCNET	INFORMATION ABOUT AFSCNET
3/ 7/78	METAQUE	AUTOMATIC DISPOSITION OF META PLOT FILES
2/10/78	SWITCH	NEW INTERCOM PHONE SWITCH
1/17/78	DIFFER	DIFFERENCES IN NOS/BE FROM 6600 TO CYBER 176
1/ 4/78	DISSTIP	DISSPLA TECH. INFO. PROGRAMMING SUGGESTIONS
10/ 3/77	DISSPLA	A NEW USER ORIENTED PLOTING PACKAGE

SYSTEM WARNINGS

8/16/78	BUDGETARY CONSIDERATION FOR FY 79: 176 CHARGES WILL GO UP BY ABOUT 15%.
8/16/78	REVIEW, SIGN AND RETURN TAPE INVENTORY LISTINGS BEFORE 21 AUGUST 1978.
8/16/78	+++++ FLASH MESSAGE +++++ CYBER RECORD MANAGER ANALYSIS CLASS HAS BEEN
8/16/78	+++++ CHANGED TO AUG 28-30. ALL CLASS MEMBERS TAKE NOTE ++++ FLASH +++
8/16/78	** NOTICE TO CONTRACTORS ** CONTRACTOR WORK AREA IN ROOM 110 OF BLDG
8/16/78	412 WILL NOT BE AVAILABLE AFTER 28 AUG 78. THIS WILL BE THE NEW
8/16/78	PCAM AREA. PLEASE REMOVE ALL LISTINGS OR CARD DECKS STORED THERE.
8/16/78	

```
+
KEEL RUN
+
```

+
+ + +
+

EQUATION OF STATE -

SOLIDS - NO STRENGTH

ATMOSPHERE -

CONSTANT

VOLUME AND ENERGY FLUXING

THE FOLLOWING OPTIONS WERE DEFINED BY PLANK.

+

ATMOS	=	5
BURN	=	0
CODE	=	1
DIMEN	=	2
EOS	=	6
GEOM	=	2
HOT	=	0
IMAX	=	20
ISLAND	=	0
JMAX	=	28
KMAX	=	1
LBUFA	=	0
LBUFB	=	0
MAGFLD	=	0
METHOD	=	2
NH	=	20
NHIC	=	1600
NM	=	3
NOP	=	1000
NHIST	=	6
NPLPB	=	2
NPP	=	2
NROWPB	=	4
NSTN	=	0
NVARST	=	15
RAD	=	0
REZONE	=	1
STRESS	=	1
SURF	=	0
SW	=	0
SWX	=	1
VISC	=	0
LAMB	=	0
BBOUND	=	0
LBOUND	=	0
KEEL	=	0
PULL	=	0
VOIDS	=	0
FLUXER	=	3
DEPOS	=	0
FAIL	=	0
STRAIN	=	1
WORK	=	0
FIREIN	=	0
MAT	=	3
AIR	=	1
FE	=	2
CU	=	3

THE FOLLOWING OPTIONS WERE SPECIFIED WHEN EXECUTIVE PROCESSING BEGAN

INST	=	1
PRG	=	0
PLANK	=	0
PULL	=	0
KEEL	=	1
LIBRARY	=	0
ATMOS	=	5
BURN	=	0
CODE	=	1
DIMEN	=	2
EOS	=	6
GEOM	=	2
HOT	=	0
IMAX	=	20
ISLAND	=	0
JMAX	=	28
KMAX	=	1
LBUFA	=	0
LBUFB	=	0
MAGFLD	=	0
METHOD	=	2
NH	=	20
NHIC	=	1600
NM	=	3
NOP	=	1000
NHIST	=	6
NPLPB	=	2
NPP	=	2
NROWPB	=	4
NSTN	=	0
NVARST	=	15
RAD	=	0
REZONE	=	1
STRESS	=	1
SURF	=	0
SW	=	0
SWX	=	1
VISC	=	0
LAMB	=	0
BBOUND	=	0
LBOUND	=	0
VOIDS	=	0
FLUXER	=	3
DEPOS	=	0
FAIL	=	0
STRAIN	=	1
WORK	=	0
FIREIN	=	0
MAT	=	3
AIR	=	1
FE	=	2
CU	=	3

+

```
+
THE FOLLOWING DEFINITIONS OR REDEFINITIONS WERE MADE DURING EXECUTIVE PROCESSING
+
+
SYS       =         176
VER       =           4
NOSBE     =           1
PF        =           1
ECS       =           1
OBJLIB    =           1
TAPELIB   =           4
ROUTE     =           1
DENSHUL   =           5
DENSLIB   =           5
DENSSTA   =           3
LABEL     =           1
DATE      =           1
CONTROL   =           1
CDC       =           1
IBM       =           0
CW        =          10
NW        =           1
RDEND     =           2
CARDL     =           8
CARDO     =          80
NHEC      =       11200
NBLKS     =           7
NPIC      =        2000
NPICMAX   =        3020
STRAIN    =           1
STRESS    =           1
DEBUG     =           0
FILMFR    =           1
HLEV      =           1
D$NAMEA   =          21
D$NAMEB   =          12
D$NAMEB   =          13
D$NAMEB   =          15
D$NAMEC   =          14
D$NAMEC   =          15
D$NAMEC   =          16
D$NAMEC   =          18
D$NAMED   =           5
AIREOS    =           1
IMIN      =         250
JMIN      =         250
NHIN      =        5000
```

KEEL OUTPUT
+
CU PENETRATOR
+
ZBLK

PROB	1.20000000000000E+00	1720463146314632
ATMOS	5.00000000000000E+00	1722520000000000000
BREF	0.	0000000000000000000
CODE	1.00000000000000E+00	1720400000000000000
COLD	0.	7777777777777777776
CYCLE	0.	0000000000000000000
DIMEN	2.00000000000000E+00	1721400000000000000
DT	1.00000000000000E-08	1665527461670430214 2
ELC	0.	0000000000000003000
EOS	6.00000000000000E+00	1722600000000000000
ETH	0.	0000000000000000000
EXPAND	5.00000000000000E-02	1713631463146314631 5
FAIL	0.	0000000000000000000
FLUXER	3.00000000000000E+00	1721600000000000000
GEOM	2.00000000000000E+00	1721400000000000000
IMAX	2.00000000000000E+01	1724500000000000000
IQ	1.90000000000000E+01	1724600000000000000
ISLAND	0.	0000000000000000000
JMAX	2.30000000000000E+01	1724700000000000000
JQ	2.70000000000000E+01	1724600000000000000
HDB	0.	0000000000000000000
LREF	0.	7777777777777777776
METHOD	2.00000000000000E+00	1721400000000000000
MLC	0.	0000000000000000000
MTH	0.	0000000000000000000
NH	2.00000000000000E+01	1724500000000000000
NHIC	1.60000000000000E+03	1732620000000000000
NHIST	6.00000000000000E+00	1722600000000000000
NM	3.00000000000000E+00	1721600000000000000
NOP	0.	0000000000000000000
NPP	2.00000000000000E+00	1721400000000000000
NROWPB	4.00000000000000E+00	1722400000000000000
PTSTOP	6.00000000000000E+02	1731454000000000000
RADLOS	0.	0000000000000000000
REZONE	1.00000000000000E+00	1720400000000000000
RREF	0.	0000000000000000000
STABF	5.00000000000000E-01	1717400000000000000
STRAIN	1.00000000000000E+00	1720400000000000000
STRESS	1.00000000000000E+00	1720400000000000000
SUME	0.	0000000000000000000
T	0.	0000000000000000000
TERAD	0.	0000000000000000000
TLC	0.	0000000000000000000
TREF	0.	0000000000000000000
TTIME	0.	0000000000000000000
TTIME6	0.	0000000000000000000
TTIME7	0.	0000000000000000000
TTSTOP	1.00000000000000E+02	1726620000000000000
UREZ	1.00000000000000E+01	1723500000000000000
VISC	0.	0000000000000000000
VREZ	1.00000000000000E+01	1723500000000000000
VOIDS	0.	0000000000000000000
WORK	0.	0000000000000000000
X1	4.00000000000000E+00	1722400000000000000
X2	-1.00000000000000E+00	6057377777777777777
XDB	0.	0000000000000000000
Y1	5.00000000000000E+00	1722500000000000000
Y2	2.30000000000000E+01	1724560000000000000
YGND	0.	0000000000000000000
YIELD	0.	0000000000000000000
AIR	1.00000000000000E+00	1720400000000000000
CU	3.00000000000000E+00	1721600000000000000
FE	2.00000000000000E+00	1721400000000000000

MESH INCREMENTS AND COORDINATES

I	DX	X	I	DX	X	I	DX	X
X0= 0.								
1	2.50000000E-01	2.50000000E-01	2	2.50000000E-01	5.00000000E-01	3	2.50000000E-01	7.50000000E-01
4	2.50000000E-01	1.00000000E+00	5	2.50000000E-01	1.25000000E+00	6	2.50000000E-01	1.50000000E+00
7	2.50000000E-01	1.75000000E+00	8	2.50000000E-01	2.00000000E+00	9	2.50000000E-01	2.25000000E+00
10	2.50000000E-01	2.50000000E+00	11	2.50000000E-01	2.75000000E+00	12	2.50000000E-01	3.00000000E+00
13	2.50000000E-01	3.25000000E+00	14	2.50000000E-01	3.50000000E+00	15	2.50000000E-01	3.75000000E+00
16	2.50000000E-01	4.00000000E+00	17	2.50000000E-01	4.25000000E+00	18	2.50000000E-01	4.50000000E+00
19	2.50000000E-01	4.75000000E+00	20	2.50000000E-01	5.00000000E+00			

J	DY	Y	J	DY	Y	J	DY	Y
Y0= -2.00000000E+00								
1	2.50000000E-01	-1.75000000E+00	2	2.50000000E-01	-1.50000000E+00	3	2.50000000E-01	-1.25000000E+00
4	2.50000000E-01	-1.00000000E+00	5	2.50000000E-01	-7.50000000E-01	6	2.50000000E-01	-5.00000000E-01
7	2.50000000E-01	-2.50000000E-01	8	2.50000000E-01	0.	9	2.50000000E-01	2.50000000E-01
10	2.50000000E-01	5.00000000E-01	11	2.50000000E-01	7.50000000E-01	12	2.50000000E-01	1.00000000E+00
13	2.50000000E-01	1.25000000E+00	14	2.50000000E-01	1.50000000E+00	15	2.50000000E-01	1.75000000E+00
16	2.50000000E-01	2.00000000E+00	17	2.50000000E-01	2.25000000E+00	18	2.50000000E-01	2.50000000E+00
19	2.50000000E-01	2.75000000E+00	20	2.50000000E-01	3.00000000E+00	21	2.50000000E-01	3.25000000E+00
22	2.50000000E-01	3.50000000E+00	23	2.50000000E-01	3.75000000E+00	24	2.50000000E-01	4.00000000E+00
25	2.50000000E-01	4.25000000E+00	26	2.50000000E-01	4.50000000E+00	27	2.50000000E-01	4.75000000E+00
28	2.50000000E-01	5.00000000E+00						

```
        GENERATING PROBLEM    1.2000
+
  DEFAULT WILL BE
+
GENERATE A CIRCLE     OF MATERIAL  1
        XC =  0.            YC =  0.            RADIUS =  0.
+
    AIR       =  1
+
GENERATE A RECTANGLE  OF MATERIAL  1
        X1 =  0.            X2 =  5.0000000E+00 Y1 = -2.0000000E+00 Y2 = -1.0000000E+00
+
     9.621128E-02 GMS   4.526163E+09 ERGS INSERTED AS MATERIAL  1
+
+
+
    FE        =  2
+
GENERATE A RECTANGLE  OF MATERIAL  2
        X1 =  0.            X2 =  5.0000000E+00 Y1 = -1.0000000E+00 Y2 =  0.
+
     6.173230E+02 GMS   2.856240E+13 ERGS INSERTED AS MATERIAL  2
+
+
+
    AIR       =  1
+
GENERATE A RECTANGLE  OF MATERIAL  1
        X1 =  0.            X2 =  5.0000000E+00 Y1 =  0.            Y2 =  5.0000000E+00
    DELETE A RECTANGLE
        X1 =  0.            X2 =  1.0000000E+00 Y1 =  0.            Y2 =  4.0000000E+00
+
     4.656626E-01 GMS   9.518143E+08 ERGS INSERTED AS MATERIAL  1
+
+
+
    CU        =  3
+
GENERATE A RECTANGLE  OF MATERIAL  3
        X1 =  0.            X2 =  1.0000000E+00 Y1 =  0.            Y2 =  4.0000000E+00
+
     1.118407E+02 GMS   1.267555E+11 ERGS INSERTED AS MATERIAL  3
+
+
+
ZBLK
    PROB          1.2000000000000E+00     1720463146314632
    ATMUS         5.0000000000000E+00     1722500000000000000
    BREF          0.                      0000000000000000000
    CODE          1.0000000000000E+00     1720400000000000000
    COLD          0.                      7777777777777777776
    CYCLE         0.                      0000000000000000000
    DIMEN         2.0000000000000E+00     1721400000000000000
    DT                                    [illegible]
```

ELC	0.	0000000000000000000
EOS	6.000000000000E+00	1722600000000000000
ETH	0.	0000000000000000000
EXPAND	5.000000000000E-02	1713631463146314631
FAIL	0.	0000000000000000000
FLUXER	3.000000000000E+00	1721600000000000000
GEOM	2.000000000000E+00	1721400000000000000
IMAX	2.000000000000E+01	1724500000000000000
IQ	1.900000000000E+01	1724460000000000000
ISLAND	0.	0000000000000000000
JMAX	2.000000000000E+01	1724700000000000000
JQ	2.700000000000E+01	1724660000000000000
HOB	0.	0000000000000000000
LREF	0.	7777777777777777776
METHOD	2.000000000000E+00	1721400000000000000
MLC	0.	0000000000000000000
MTH	0.	0000000000000000000
NH	2.000000000000E+01	1724500000000000000
NHIC	1.600000000000E+03	1732620000000000000
NHIST	6.000000000000E+00	1722600000000000000
NM	3.000000000000E+00	1721600000000000000
NOP	0.	0000000000000000000
NPP	2.000000000000E+00	1721400000000000000
NROWPB	4.000000000000E+00	1722400000000000000
PTSTOP	6.000000000000E+02	1731454000000000000
RADLOS	0.	0000000000000000000
REZONE	1.000000000000E+00	1720400000000000000
RREF	0.	0000000000000000000
STABF	5.000000000000E-01	1717400000000000000
STRAIN	1.000000000000E+00	1720400000000000000
STRESS	1.000000000000E+00	1720400000000000000
SUME	0.	0000000000000000000
T	0.	0000000000000000000
TERAD	0.	0000000000000000000
TLC	0.	0000000000000000000
TREF	0.	0000000000000000000
TTIME	0.	0000000000000000000
TTIME6	0.	0000000000000000000
TTIME7	0.	0000000000000000000
TTSTOP	1.000000000000E+02	1726620000000000000
UREZ	1.000000000000E+01	1723500000000000000
VISC	0.	0000000000000000000
VREZ	1.000000000000E+01	1723500000000000000
VOIDS	0.	0000000000000000000
WORK	0.	0000000000000000000
X1	4.000000000000E+00	1722400000000000000
X2	-1.000000000000E+00	6057377777777777777
XOB	0.	0000000000000000000
Y1	5.000000000000E+00	1722500000000000000
Y2	2.300000000000E+01	1724560000000000000
YGND	0.	0000000000000000000
YIELD	0.	0000000000000000000
AIR	1.000000000000E+00	1720400000000000000
CU	3.000000000000E+00	1721600000000000000
FE	2.000000000000E+00	1721400000000000000

+
+
+

INDIVIDUAL MASS SUMS

5.618738E-01 6.173230E+02 1.118407E+02

+
+
+
+
I= 1 X(I)= .250 DX(I)= .250
+

J	U	V	AIX	RHO	AMX	DY	Y
1	0.	3.00000000E+05	2.04400000E+09	1.22500000E-03	6.01320469E-05	2.50000000E-01	-1.75000000E+00
2	0.	3.00000000E+05	2.04400000E+09	1.22500000E-03	6.01320469E-05	2.50000000E-01	-1.50000000E+00
3	0.	3.00000000E+05	2.04400000E+09	1.22500000E-03	6.01320469E-05	2.50000000E-01	-1.25000000E+00
4	0.	3.00000000E+05	2.04400000E+09	1.22500000E-03	6.01320469E-05	2.50000000E-01	-1.00000000E+00
5	0.	3.00000000E+05	1.26816212E+09	7.86000000E+00	3.85826848E-01	2.50000000E-01	-7.50000000E-01
6	0.	3.00000000E+05	1.26816212E+09	7.86000000E+00	3.85826848E-01	2.50000000E-01	-5.00000000E-01
7	0.	3.00000000E+05	1.26816212E+09	7.86000000E+00	3.85826848E-01	2.50000000E-01	-2.50000000E-01
8	0.	3.00000000E+05	1.26816212E+09	7.86000000E+00	3.85826848E-01	2.50000000E-01	0.
9	0.	0.	1.13335748E+09	8.90000000E+00	4.36877728E-01	2.50000000E-01	2.50000000E-01
10	0.	0.	1.13335748E+09	8.90000000E+00	4.36877728E-01	2.50000000E-01	5.00000000E-01
11	0.	0.	1.13335748E+09	8.90000000E+00	4.36877728E-01	2.50000000E-01	7.50000000E-01
12	0.	0.	1.13335748E+09	8.90000000E+00	4.36877728E-01	2.50000000E-01	1.00000000E+00
13	0.	0.	1.13335748E+09	8.90000000E+00	4.36877728E-01	2.50000000E-01	1.25000000E+00
14	0.	0.	1.13335748E+09	8.90000000E+00	4.36877728E-01	2.50000000E-01	1.50000000E+00
15	0.	0.	1.13335748E+09	8.90000000E+00	4.36877728E-01	2.50000000E-01	1.75000000E+00
16	0.	0.	1.13335748E+09	8.90000000E+00	4.36877728E-01	2.50000000E-01	2.00000000E+00
17	0.	0.	1.13335748E+09	8.90000000E+00	4.36877728E-01	2.50000000E-01	2.25000000E+00
18	0.	0.	1.13335748E+09	8.90000000E+00	4.36877728E-01	2.50000000E-01	2.50000000E+00
19	0.	0.	1.13335748E+09	8.90000000E+00	4.36877728E-01	2.50000000E-01	2.75000000E+00
20	0.	0.	1.13335748E+09	8.90000000E+00	4.36877728E-01	2.50000000E-01	3.00000000E+00
21	0.	0.	1.13335748E+09	8.90000000E+00	4.36877728E-01	2.50000000E-01	3.25000000E+00
22	0.	0.	1.13335748E+09	8.90000000E+00	4.36877728E-01	2.50000000E-01	3.50000000E+00
23	0.	0.	1.13335748E+09	8.90000000E+00	4.36877728E-01	2.50000000E-01	3.75000000E+00
24	0.	0.	1.13335748E+09	8.90000000E+00	4.36877728E-01	2.50000000E-01	4.00000000E+00
25	0.	0.	2.04400000E+09	1.22500000E-03	6.01320469E-05	2.50000000E-01	4.25000000E+00
26	0.	0.	2.04400000E+09	1.22500000E-03	6.01320469E-05	2.50000000E-01	4.50000000E+00
27	0.	0.	2.04400000E+09	1.22500000E-03	6.01320469E-05	2.50000000E-01	4.75000000E+00
28	0.	0.	2.04400000E+09	1.22500000E-03	6.01320469E-05	2.50000000E-01	5.00000000E+00

MATERIAL MASSES

J	1	2	3
1	6.01320469E-05	0.	0.
2	6.01320469E-05	0.	0.
3	6.01320469E-05	0.	0.
4	6.01320469E-05	0.	0.
5	0.	3.85826848E-01	0.
6	0.	3.85826848E-01	0.
7	0.	3.85826848E-01	0.
8	0.	3.85826848E-01	0.
9	0.	0.	4.36877728E-01
10	0.	0.	4.36877728E-01
11	0.	0.	4.36877728E-01
12	0.	0.	4.36877728E-01
13	0.	0.	4.36877728E-01
14	0.	0.	4.36877728E-01
15	0.	0.	4.36877728E-01
16	0.	0.	4.36877728E-01
17	0.	0.	4.36877728E-01
18	0.	0.	4.36877728E-01
19	0.	0.	4.36877728E-01
20	0.	0.	4.36877728E-01
21	0.	0.	4.36877728E-01
22	0.	0.	4.36877728E-01
23	0.	0.	4.36877728E-01
24	0.	0.	4.36877728E-01
25	6.01320469E-05	0.	0.
26	6.01320469E-05	0.	0.
27	6.01320469E-05	0.	0.
28	6.01320469E-05	0.	0.

MATERIAL MAP
(1- 20)

```
+
          1         2

                                ALTITUDE
   12345678901234567890

                                  METERS
 1 ++++++++++++++++++++ -1.750E-02
 2 ++++++++++++++++++++ -1.500E-02
 3 ++++++++++++++++++++ -1.250E-02
 4 ++++++++++++++++++++ -1.000E-02
 5 XXXXXXXXXXXXXXXXXXX -7.500E-03
 6 XXXXXXXXXXXXXXXXXXX -5.000E-03
 7 XXXXXXXXXXXXXXXXXXX -2.500E-03
 8 XXXXXXXXXXXXXXXXXXX  0.
 9 OOOO++++++++++++++++  2.500E-03
10 OOOO++++++++++++++++  5.000E-03
11 OOOO++++++++++++++++  7.500E-03
12 OOOO++++++++++++++++  1.000E-02
13 OOOO++++++++++++++++  1.250E-02
14 OOOO++++++++++++++++  1.500E-02
15 OOOO++++++++++++++++  1.750E-02
16 OOOO++++++++++++++++  2.000E-02
17 OOOO++++++++++++++++  2.250E-02
18 OOOO++++++++++++++++  2.500E-02
19 OOOO++++++++++++++++  2.750E-02
20 OOOO++++++++++++++++  3.000E-02
21 OOOO++++++++++++++++  3.250E-02
22 OOOO++++++++++++++++  3.500E-02
23 OOOO++++++++++++++++  3.750E-02
24 OOOO++++++++++++++++  4.000E-02
25 ++++++++++++++++++++  4.250E-02
26 ++++++++++++++++++++  4.500E-02
27 ++++++++++++++++++++  4.750E-02
28 ++++++++++++++++++++  5.000E-02
   12345678901234567890
            1         2
```

```
  MFX   NOS/BE 1.2    KAFB  011 MFX   07/10/78
  FLCM=314000 MXCM=250000 FLEC=1720K  MXEC=0600K
+
08.58.40.GABY22Y  FROM MX2/IS
08.58.40.IP  00000320 WORDS - FILE INPUT  , DC 04
08.58.40.GABY2,T177,IO177,P50,NT1.
08.58.41.ACCOUNT,GABY,*********-***,DYP.
08.58.41.SYSBULL(BATCH)
08.58.42.ATTACH,HULLIB,ID=DYMXCER.
08.58.42.PFN IS
08.58.42.HULLIB
08.58.42.PF CYCLE NO. = 039
08.58.42.LIBRARY,HULLIB.
08.59.10.HULLR.
08.59.11.COPYCR(LOCAL,HHH)
08.59.12.RETURN(LOCAL)
08.59.12.IFE,FILE(CHANGES,IN),CPR.
08.59.13.ENDIF,CPR.
08.59.13.IFE,FILE(CHANGES,AS.AND..NOT.IN),CPY.
08.59.14.ENDIF,CPY.
08.59.14.GETC,HHH.
08.59.15.ATTACH(XXX,CH105,ID=DYMXCER)
08.59.16.PF CYCLE NO. = 014
08.59.16.COPYCR(XXX,HHH)
08.59.17.RETURN(XXX)
08.59.19.REVERT.
08.59.19.CONTR.80W.
09.00.06.      END  CNT
09.00.06.FILE(TAPE10,SBF=NO)
09.00.09.FILE(TAPE11,SBF=NO)
09.00.09.FILE(TAPE41,SBF=NO)
09.00.10.FILE(TAPE42,SBF=NO)
09.00.11.LDSET(FILES=TAPE10/TAPE11/TAPE41/TAPE42)
09.00.11.80W.
09.00.14.REQUEST(TAPE10,*PF)
09.00.14.REQUEST(TAPE42,*PF)
09.01.06.STERN, PROBLEM     8.3630 UPDATED.
09.02.11.CT ID=  DYMXCER PFN=DYMASTLIBRARY
09.02.11.CT CY= 002  00040064 WORDS.
09.02.11.EX ID=  DYMXCER PFN=DYMASTLIBRARY
09.02.11.EX CY= 001  00000000 WORDS.
09.02.11.EX ID=  DYMXCER PFN=DYMASTLIBRARY
09.02.11.EX CY= 001  00000000 WORDS.
09.03.00.EX ID=  DYMXCER PFN=DYMASTLIBRARY
09.03.00.EX CY= 001  00040064 WORDS.
09.03.00.PR ID=  DYMXCER PFN=DYMASTLIBRARY
09.03.00.PR CY= 002  00040064 WORDS.
09.03.00.REQUEST(TAPE42,*PF)
09.03.01.PR ID=  DYMXCER PFN=PROBLEMMASTAPE41INF08P3630
09.03.01.PR CY= 001  00000640 WORDS.
09.03.03.STERN   10 RESOURCE TAPES REMAINING
09.03.16.KEEL    10 RESOURCE TAPES REMAINING
09.05.57.CT ID=  DYMXCER PFN=DYMASTLIBRARY
09.05.57.CT CY= 002  00040128 WORDS.
09.30.07.PE10)
09.30.07.LDSET(FILES=TAPE44/TAPE45)
09.30.07.HULL.
09.34.17.LOCKOUT.
09.34.17.UNLOCK,EXP.
09.34.19.REQUEST(TAPE4,*NT,PE,RING,IU,U,E,VSN=01K127)
09.34.19.( NT 066 ASSIGNED)
09.34.19.NT66 VOLUME SERIAL NUMBER IS  01K127
09.34.23.NT66  BLOCKS WRITTEN -000034
09.34.24.REQUEST(TAPE41,*PF)
09.34.27.CT ID=  DYMXCER PFN=PROBLEMMASTAPE41INF01P2000
09.34.27.CT CY= 001  00000512 WORDS.
09.34.29.      END  KEEL
09.34.29.       .838 CP SECONDS EXECUTION TIME
09.34.29.RETURN(TAPE4,HULL)
09.34.30.REVERT.
09.34.32.ELSE,H176.
09.34.34.ENDIF,H176.
09.34.34.ENDIF,RUNS.
09.34.36.ACCOUN.
09.34.42.ACCOUNT FILE = ACCOUNTKJ2BV1OF5P8
09.34.42.  ACCOUNT ID = DYMXCER
09.34.44.      END  ACCNT
09.34.44.REVERT.
09.34.45.OP  00003200 WORDS - FILE OUTPUT , DC 40
09.34.45.OP  00002048 WORDS - FILE FILMPR , DC 20
09.34.45.MS     7168  WORDS  (  218624 MAX USED)
09.34.45.CPA      22.372 SEC.        22.372 ADJ.
09.34.45.IO       76.854 SEC.        19.213 ADJ.
09.34.45.CM     1583.018 KWS.         6.642 ADJ.
09.34.45.SS                          48.228
09.34.45.PP      155.711 SEC.      DATE 08/21/78
09.34.45.COST ESTIMATE              $ 8.10
09.34.45.EJ  END OF JOB, IS
```

```
09.05.57.EX ID=  DYMXCER PFN=DYMASTLIBRARY
09.05.57.EX CY= 001  00000000 WORDS.
09.06.08.EX ID=  DYMXCER PFN=DYMASTLIBRARY
09.06.08.EX CY= 001  00040120 WORDS.
09.06.08.PR ID=  DYMXCER PFN=DYMASTLIBRARY
09.06.08.PR CY= 002  00040120 WORDS.
09.06.08.NEED IK127
09.06.11.      END  BOW
09.06.11.CONTR,PLANK.
09.06.14.      END  CNT
09.06.14.FILE(TAPE4,SBF=NO)
09.06.25.FILE(TAPE41,SBF=NO)
09.06.31.LDSET(FILES=TAPE4/TAPE41)
09.06.31.PLANK.
09.06.34.GENERATING KEEL      WA-ECS/LCM VERSION
09.06.35.      END  PLANK
09.06.35.CONTR,SAIL.
09.06.37.      END  CNT
09.06.37.DYMAST(I=HHH)
09.28.46.     6265  CARDS GENERATED
09.28.46.  END OF  NORMAL      RUN
09.28.46.  SYSTEM  HULL        VERSION  105
09.28.46.  EXIT
09.28.46.RETURN(HHH)
09.28.47.RETURN(SAVE)
09.28.48.REQUEST(SAVE,*Q)
09.28.49.CONTR,COMPILE.
09.28.51.      END  CNT
09.28.51.IFE,R2.EQ.2,COMPS.
09.28.52.ELSE,COMPS.
09.28.52.FTN(A,I=SAIL,PL=1000000,B=HULL,OPT=2,L=S
09.28.52.AVE)
09.29.44.      4.187 CP SECONDS COMPILATION TIME
09.29.44.ENDIF,COMPS.
09.29.45.RETURN(SAIL,LOCAL)
09.29.47.IFE,R2.NE.0,MET.
09.29.48.ENDIF,MET.
09.29.48.RETURN(MAP)
09.29.49.REQUEST(MAP,*Q)
09.29.49.CONTR,LOAD.
09.29.57.      END  CNT
09.29.57.IFE,R2.EQ.2,RUNS.
09.29.58.ELSE,RUNS.
09.29.58.IFE,R1.NE.0,H176.
09.29.59.HULE176,COMMENT.
09.30.00.FILE(TAPE4,SBF=NO)
09.30.01.FILE(TAPE41,SBF=NO)
09.30.02.FILE(TAPE9,SBF=NO)
09.30.03.FILE(TAPE40,SBF=NO)
09.30.04.FILE(TAPE10,SBF=NO)
09.30.04.FILE(TAPE44,SBF=NO)
09.30.05.FILE(TAPE45,SBF=NO)
09.30.07.LDSET(PRESETA=NGINDEF,MAP=SBEX/MAP)
09.30.07.LDSET(FILES=TAPE4/TAPE41/TAPE9/TAPE40/TA
```

PROBLEM 1.2 SYSTEM 370 HULL RUN

```
//AF2001H JOB (AF2001,,10,25),'HULL RUN',MSGCLASS=H,CLASS=C,
//         NOTIFY=AF2001
//HULL EXEC HULL,GENO='.V105',FPARM='NOSOURCE,TERM',
//       PS1='SYSOUT=H,HOLD=YES',PS2='SYSOUT=H,HOLD=YES',
//       FP1='DUMMY',LP1='SYSOUT=H,HOLD=YES',
//       HP1='SYSOUT=H,HOLD=YES',HTIME=5,LIBPRE='AF2001.',
//       OLDPRE='AF2001.',PP1='SYSOUT=H,HOLD=YES',PTIME='(0,10)'
//HULL.DATA DD  DSN=AF2001.HULL.PROB1P2,DISP=(OLD,KEEP),
//     DCB=(RECFM=VBS,LRECL=7220,BLKSIZE=7224)
//HULL.STATION  DD DUMMY
//HULL.INPUT DD  *
HULL
PROBLEM 1.2
CYCLE=0
INPUT
RTSTOP=0.08
CSTOP=150
REZONE=0
COLD=T
TIMES=3 DMPINT=1.E-6
MRELER=10
/*
//SAIL.INPUT  DD  DSN=AF2001.CHANG.DATA,DISP=(OLD,KEEP)
//FORT.SYSTERM  DD  SYSOUT=H,HOLD=YES
END OF DATA
```

```
                                                    J E S 2   J O B   L O G
12.22.49 JOB  204  IEF677I WARNING MESSAGE(S) FOR JOB AF2001H  ISSUED
12.22.49 JOB  204  $HASP373 AF2001H  STARTED - INIT  4 - CLASS C - SYS A168
12.22.53 JOB  204  AF2001H  HULL     12:22:49      3      0.24  S000
12.22.57 JOB  204  AF2001H  PLANK    12:22:53      5      0.80  S000
12.30.10 JOB  204  AF2001H  SAIL     12:22:58    432     95.82  S000
12.32.29 JOB  204  AF2001H  FORT     12:30:10    138     22.55  S004
12.32.52 JOB  204  AF2001H  LKED     12:32:29     23      2.22  S000
12.43.49 JOB  ■04  AF2001H  GO       12:32:53    656    280.41  S000
12.43.53 JOB  204  $HASP395 AF2001H  ENDED

OUT
■
```

```
GENERATING HULL
TAPE4 SEARCH FOR START CYCLE


CU PENETRATOR                                                    00002250


PROB    1.2000  CYCLE     0  TIME 0.0
BACKSPACING    2 RECORDS
TAPE POSITIONED
               DISK VERSION



      ***** OPTIONS SELECTED FOR THIS RUN *****

            DIFFERENCE METHOD -
                                SHELL II
                                                  AND MATERIAL STRENGTH
                                                                 WITH 6 FLUXED HISTORIES/CELL

            EQUATION OF STATE -
                                SOLIDS - NO STRENGTH
            ATMOSPHERE -
                                 CONSTANT
            VOLUME AND ENERGY FLUXING
            REZONE -
                               NO REZONE
            CODE -
                              HULL
            DIMENSIONS -
                                2-D
            GEOMETRY -
                              CYLINDRICAL
            NO RADIATION ROUTINES
            PARTICLES -
                               NO CODE
THE FOLLOWING OPTIONS WERE DEFINED BY PLANK.

      ATMOS     =          5
      BURN      =          0
      CODE      =          1
      DIMEN     =          2
      EOS       =          6
      GEOM      =          2
      HOT       =          0
      IMAX      =         20
      ISLAND    =          0
```

JMAX	=	28
KMAX	=	1
LBUFA	=	1729
LBUFB	=	122
MAGFLD	=	0
METHOD	=	2
MH	=	20
MHIC	=	1600
MM	=	3
MOP	=	0
MHIST	=	6
MPLPB	=	2
MPP	=	3
MROWPB	=	4
MSTN	=	0
MVARST	=	5
RAD	=	0
REZONE	=	0
STRESS	=	1
SURF	=	0
SW	=	6
SWX	=	0
VISC	=	0
LAMB	=	0
BBOUND	=	0
LBOUND	=	0
KEEL	=	0
PULL	=	0
VOIDS	=	0
FLUXER	=	3
DEPOS	=	0
FAIL	=	0
STRAIN	=	1
WORK	=	0
MAT	=	3
AIR	=	1
CU	=	3
FE	=	2

OUT

HULL START

PROB 1.2000 STARTUP ON CYCLE 0 TIME 0.0

MATERIAL PROPERTIES DEFINED FOR THIS RUN

MATERIAL	AMBIENT YIELD (Y0)	THERMAL SHOFTENING YLD/Y0	EE/EMELT	WORK HARDENING YIELD	PLASTIC STRAIN
2	4.690E+09	1.00E+00	0.0	4.690E+09	0.0
		9.00E-01	5.00E-01	5.500E+09	3.00E-01
		9.00E-01	5.00E-01		
		0.0	1.00E+00		
3	8.000E+08	1.00E+00	0.0	8.000E+08	0.0
		9.00E-01	5.00E-01	4.000E+09	3.00E-01
		9.00E-01	5.00E-01		
		0.0	1.00E+00		

CU PENETRATOR 00002250

BLK/ PROB	1.20000D+00	4113333300000000
ATMOS	5.00000D+00	4150000000000000
BREF	0.0	0000000000000000
CODE	1.00000D+00	4110000000000000
COLD	0.00001D-79	0000000100000000
CYCLE	0.0	0000000000000000
DIMEN	2.00000D+00	4120000000000000
DT	1.00000D-08	3A2AF31E00000000
ELC	0.0	0000000000000000
EOS	6.00000D+00	4160000000000000
ETH	0.0	0000000000000000
EXPAND	5.00000D-02	3FCCCCCD00000000
FAIL	0.0	0000000000000000
FLUXER	3.00000D+00	4130000000000000
GEOM	2.00000D+00	4120000000000000
IMAX	2.00000D+01	4214000000000000

IQ	1.90000D+01	4213000000000000
ISLAND	0.0	0000000000000000
JMAX	2.80000D+01	421C000000000000
JQ	2.70000D+01	421B000000000000
HOB	0.0	0000000000000000
LREF	0.00001D-79	0000000100000000
METHOD	2.00000D+00	4120000000000000
MLC	0.0	0000000000000000
MTH	0.0	0000000000000000
NH	2.00000D+01	4214000000000000
NHIC	1.60000D+03	4364000000000000
NHIST	6.00000D+00	4160000000000000
NN	3.00000D+00	4130000000000000
NOP	0.0	0000000000000000
NPP	3.00000D+00	4130000000000000
NROWPB	4.00000D+00	4140000000000000
PTSTOP	6.00000D+02	4325800000000000
RADLOS	0.0	0000000000000000
REZONE	0.0	0000000000000000
RREF	0.0	0000000000000000
STABF	5.00000D-01	4080000000000000
STRAIN	1.00000D+00	4110000000000000
STRESS	1.00000D+00	4110000000000000
SUME	0.0	0000000000000000
T	0.0	0000000000000000
TERAD	0.0	0000000000000000
TLC	0.0	0000000000000000
TREF	0.0	0000000000000000
TTIME	0.0	0000000000000000
TTSTOP	1.00000D+02	4264000000000000
UREZ	1.00000D+01	41A0000000000000
VISC	0.0	0000000000000000
VREZ	1.00000D+01	41A0000000000000
VOIDS	0.0	0000000000000000
WORK	0.0	0000000000000000
X1	4.00000D+00	4140000000000000
X2	-1.00000D+00	C110000000000000
XOB	0.0	0000000000000000
Y1	5.00000D+00	4150000000000000
Y2	2.30000D+01	4217000000000000
YGND	0.0	0000000000000000
YIELD	0.0	0000000000000000
AIR	1.00000D+00	4110000000000000
CU	3.00000D+00	4130000000000000
FE	2.00000D+00	4120000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000

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          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
          0.0            0000000000000000
NOPT
    MRELER     1.000D+01     41A000010C6F7A0B
    CSTOP      1.500D+02     429600068DB8BAC7
    RTSTOP     8.000D-02     40147AE172A1323E
    DCYCST     1.000D+20     5156BC7600000000
    PRINTW     0.000D-79     0000000100000000
    DEBUG      0.0           0000000000000000
    X1NEW      1.500D+01     41F0000000000000
    Y1NEW      5.500D+01     4237000000000000
    Y2NEW      8.500D+01     4255000000000000
    TIMES      3.000D+00     413000010C6F7A0B
    DMPINT     1.000D-06     3C10C6F7BCDBAFF5
    VMIN       1.000D-03     3E41893700000000
    ITRACE     0.0           0000000000000000
    JTRACE     0.0           0000000000000000

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PROB    1.2000      CYCLE     0      TIME  0.0             DT  1.000000E-08


     INTERNAL ENERGY           KINETIC ENERGY           TOTAL ENERGY              ETH                    REL ERROR
   8.34290057     E+11    2.50736835      E+13    2.59079641      E+13    2.59079641      E+13    0.0
```

TOTAL MASS		MTH		RELMERR
6.69416748	E+02	6.69416748	E+02	0.0

MAX VEL = 0.0 AT I 0 J 0

MAX CS = 0.0 AT I 0 J 0

MAX TEMP= 0.0 AT I 0 J 0

MAX P = 0.0 AT I 0 J 0

CELL SETTING DT, I 0 J 0

TOTAL TIME FOR THIS PROBLEM 0 HOURS, 0 MIN, 0 SEC

TIME FOR THIS RUN 0 HOURS, 0 MIN, 0 SEC

I= 1 X(I)= 0.250 DX(I)= 0.250

J	P	U	V	XI	RHO	SRR	SZZ	SRZ	Y	DY	M	XM	M	XM
1	1.013E+06	0.0	3.00E+05	2.044E+09	1.225E-03	0.0	0.0	0.0	-1.75E+00	2.50E-01	1	6.01319E-05		
2	1.013E+06	0.0	3.00E+05	2.044E+09	1.225E-03	0.0	0.0	0.0	-1.50E+00	2.50E-01	1	6.01319E-05		
3	1.013E+06	0.0	3.00E+05	2.044E+09	1.225E-03	0.0	0.0	0.0	-1.25E+00	2.50E-01	1	6.01319E-05		
4	1.013E+06	0.0	3.00E+05	2.044E+09	1.225E-03	0.0	0.0	0.0	-1.00E+00	2.50E-01	1	6.01319E-05		
5	-2.864E+06	0.0	3.00E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	-7.50E-01	2.50E-01	2	3.85826E-01		
6	-2.864E+06	0.0	3.00E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	-5.00E-01	2.50E-01	2	3.85826E-01		
7	-2.864E+06	0.0	3.00E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	-2.50E-01	2.50E-01	2	3.85826E-01		
8	-2.864E+06	0.0	3.00E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	2.21E-06	2.50E-01	2	3.85826E-01		
9	-3.577E+06	0.0	0.0	1.133E+09	8.900E+00	0.0	0.0	0.0	2.50E-01	2.50E-01	3	4.36877E-01		
10	-3.577E+06	0.0	0.0	1.133E+09	8.900E+00	0.0	0.0	0.0	5.00E-01	2.50E-01	3	4.36877E-01		
11	-3.577E+06	0.0	0.0	1.133E+09	8.900E+00	0.0	0.0	0.0	7.50E-01	2.50E-01	3	4.36877E-01		
12	-3.642E+05	0.0	0.0	1.133E+09	8.900E+00	0.0	0.0	0.0	1.00E+00	2.50E-01	3	4.36877E-01		
13	-2.506E+06	0.0	0.0	1.133E+09	8.900E+00	0.0	0.0	0.0	1.25E+00	2.50E-01	3	4.36877E-01		
14	-2.506E+06	0.0	0.0	1.133E+09	8.900E+00	0.0	0.0	0.0	1.50E+00	2.50E-01	3	4.36877E-01		
15	-2.506E+06	0.0	0.0	1.133E+09	8.900E+00	0.0	0.0	0.0	1.75E+00	2.50E-01	3	4.36877E-01		
16	-2.506E+06	0.0	0.0	1.133E+09	8.900E+00	0.0	0.0	0.0	2.00E+00	2.50E-01	3	4.36877E-01		
17	-2.506E+06	0.0	0.0	1.133E+09	8.900E+00	0.0	0.0	0.0	2.25E+00	2.50E-01	3	4.36877E-01		
18	-2.506E+06	0.0	0.0	1.133E+09	8.900E+00	0.0	0.0	0.0	2.50E+00	2.50E-01	3	4.36877E-01		
19	-2.506E+06	0.0	0.0	1.133E+09	8.900E+00	0.0	0.0	0.0	2.75E+00	2.50E-01	3	4.36877E-01		
20	-2.506E+06	0.0	0.0	1.133E+09	8.900E+00	0.0	0.0	0.0	3.00E+00	2.50E-01	3	4.36877E-01		
21	-2.506E+06	0.0	0.0	1.133E+09	8.900E+00	0.0	0.0	0.0	3.25E+00	2.50E-01	3	4.36877E-01		
22	-2.506E+06	0.0	0.0	1.133E+09	8.900E+00	0.0	0.0	0.0	3.50E+00	2.50E-01	3	4.36877E-01		
23	-2.506E+06	0.0	0.0	1.133E+09	8.900E+00	0.0	0.0	0.0	3.75E+00	2.50E-01	3	4.36877E-01		
24	-2.506E+06	0.0	0.0	1.133E+09	8.900E+00	0.0	0.0	0.0	4.00E+00	2.50E-01	3	4.36877E-01		
25	1.013E+06	0.0	0.0	2.044E+09	1.225E-03	0.0	0.0	0.0	4.25E+00	2.50E-01	1	6.01319E-05		
26	1.013E+06	0.0	0.0	2.044E+09	1.225E-03	0.0	0.0	0.0	4.50E+00	2.50E-01	1	6.01319E-05		
27	1.013E+06	0.0	0.0	2.044E+09	1.225E-03	0.0	0.0	0.0	4.75E+00	2.50E-01	1	6.01319E-05		
28	1.013E+06	0.0	0.0	2.044E+09	1.225E-03	0.0	0.0	0.0	5.00E+00	2.50E-01	1	6.01319E-05		

MATERIAL MAP

```
                1         2
                                    ALTITUDE
    12345678901234567890
                                     METERS
  1 ++++++++++++++++++++ -1.750E-02
  2 ++++++++++++++++++++ -1.500E-02
  3 ++++++++++++++++++++ -1.250E-02
  4 ++++++++++++++++++++ -1.000E-02
  5 XXXXXXXXXXXXXXXXXXX -7.500E-03
  6 XXXXXXXXXXXXXXXXXXX -5.000E-03
  7 XXXXXXXXXXXXXXXXXXX -2.500E-03
  8 XXXXXXXXXXXXXXXXXXX  2.205E-08
  9 0000++++++++++++++++  2.500E-03
 10 0000++++++++++++++++  5.000E-03
 11 0000++++++++++++++++  7.500E-03
 12 0000++++++++++++++++  1.000E-02
 13 0000++++++++++++++++  1.250E-02
 14 0000++++++++++++++++  1.500E-02
 15 0000++++++++++++++++  1.750E-02
 16 0000++++++++++++++++  2.000E-02
 17 0000++++++++++++++++  2.250E-02
 18 0000++++++++++++++++  2.500E-02
 19 0000++++++++++++++++  2.750E-02
 20 0000++++++++++++++++  3.000E-02
 21 0000++++++++++++++++  3.250E-02
 22 0000++++++++++++++++  3.500E-02
 23 0000++++++++++++++++  3.750E-02
 24 0000++++++++++++++++  4.000E-02
 25 ++++++++++++++++++++  4.250E-02
 26 ++++++++++++++++++++  4.500E-02
$HASP165 JOB  209  AF2001H ENDED CN(00)
 27 ++++++++++++++++++++  4.750E-02
 28 ++++++++++++++++++++  5.000E-02
    12345678901234567890
                1         2
  CYCLE     1   TIME 1.0000E-08  DT 3.285E-08   IDT    7  JDT    5
  CYCLE     2   TIME 4.2854E-08  DT 4.886E-08   IDT    3  JDT    8
  CYCLE     3   TIME 9.1713E-08  DT 6.338E-08   IDT    2  JDT    8
  CYCLE     4   TIME 1.5510E-07  DT 7.646E-08   IDT    2  JDT    8
  CYCLE     5   TIME 2.3156E-07  DT 8.837E-08   IDT    1  JDT    8
  CYCLE     6   TIME 3.1992E-07  DT 9.970E-08   IDT    1  JDT    8
  CYCLE     7   TIME 4.1962E-07  DT 1.111E-07   IDT    1  JDT    8
  CYCLE     8   TIME 5.3076E-07  DT 1.234E-07   IDT    1  JDT    8
  CYCLE     9   TIME 6.5418E-07  DT 1.371E-07   IDT    1  JDT    8
  CYCLE    10   TIME 7.9125E-07  DT 1.148E-07   IDT    1  JDT    8
  CYCLE    11   TIME 9.0606E-07  DT 9.394E-08   IDT    1  JDT    8
  CYCLE    12   TIME 1.0000E-06  DT 1.417E-07   IDT    1  JDT    8


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PROB 1.2000 CYCLE 12 TIME 9.999994E-07 DT 1.416545E-07

INTERNAL ENERGY		KINETIC ENERGY		TOTAL ENERGY		ETH		REL ERROR	
1.19457448	E+12	2.47141646	E+13	2.59087359	E+13	2.59091050	E+13	-1.42459183	E+01

		TOTAL MASS		MTH		RELMER=Nø	
6.69442139	E+02	6.69441650	E+02	7.29386330	E-01		

MAX VEL = 3.03113E+05 AT I 6 J 9

MAX CS = 7.28736E+05 AT I 1 J 8

MAX TEMP= 3.33135E+03 AT I 5 J 10

MAX P = 1.10439E+12 AT I 1 J 9

CELL SETTING DT, I 1 J 8

TOTAL TIME FOR THIS PROBLEM 0 HOURS, 0 MIN, 19 SEC

TIME FOR THIS RUN 0 HOURS, 0 MIN, 19 SEC
WHIZ FACTOR TOTAL PROBLEM = 2.94E-03 SEC/CELL/CYCLE
WHIZ FACTOR SINCE LAST DUMP = 2.79E-03 SEC/CELL/CYCLE

I= 1 X(I)= 0.250 DX(I)= 0.250

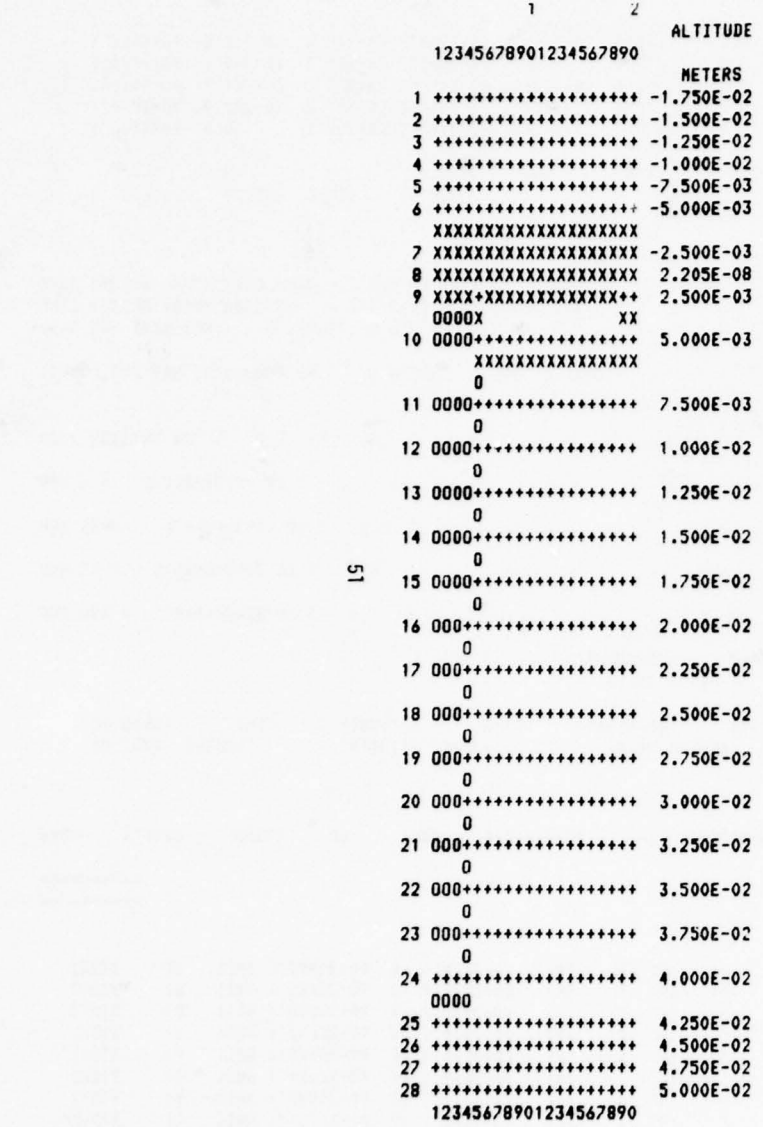
J	P	U	V	XI	RHO	SRR	SZZ	SRZ	Y	DY	M	XM	M	XM
1	1.013E+06	0.0	3.00E+05	2.044E+09	1.225E-03	0.0	0.0	0.0	-1.75E+00	2.50E-01	1	6.01319E-05		
2	1.013E+06	3.09E-02	3.00E+05	2.045E+09	1.225E-03	0.0	0.0	0.0	-1.50E+00	2.50E-01	1	6.01320E-05		
3	1.013E+06	7.58E-02	3.00E+05	2.045E+09	1.225E-03	0.0	0.0	0.0	-1.25E+00	2.50E-01	1	6.01320E-05		
4	1.020E+06	1.01E-01	3.00E+05	2.047E+09	1.232E-03	0.0	0.0	0.0	-1.00E+00	2.50E-01	1	6.04644E-05		
5	1.042E+06	1.45E+00	2.95E+05	2.073E+09	1.243E-03	0.0	0.0	0.0	-7.50E-01	2.50E-01	1	6.09974E-05		
6	1.544E+06	6.32E+01	2.80E+05	1.688E+09	6.859E+00	1.66E+09	-3.10E+09	0.0	-5.00E-01	2.50E-01	1	1.08264E-05	2	3.36694E-01
7	2.619E+11	6.70E+02	2.22E+05	4.829E+09	8.697E+00	1.74E+09	-2.95E+09	2.43E+07	-2.50E-01	2.50E-01	2	4.26926E-01		
8	7.427E+11	1.53E+03	1.58E+05	1.386E+10	9.676E+00	8.80E+08	-2.03E+09	3.61E+07	2.21E-06	2.50E-01	2	4.74966E-01		
9	1.059E+12	2.81E+03	1.60E+05	1.797E+10	1.097E+01	0.0	0.0	0.0	2.50E-01	2.50E-01	2	2.90952E-01	3	2.47529E-01
10	6.654E+11	9.55E+02	1.42E+05	1.309E+10	1.101E+01	3.55E+07	-6.89E+07	-1.11E+06	5.00E-01	2.50E-01	3	5.40666E-01		
11	2.808E+11	1.70E+02	5.29E+04	4.603E+09	1.009E+01	2.63E+08	-4.87E+08	-2.46E+06	7.50E-01	2.50E-01	3	4.95494E-01		
12	4.633E+10	8.87E+01	1.19E+04	1.353E+09	9.159E+00	3.25E+08	-5.24E+08	-1.08E+06	1.00E+00	2.50E-01	3	4.49570E-01		
13	7.615E+09	2.35E+01	1.44E+03	1.138E+09	8.947E+00	3.20E+08	-5.29E+08	-5.06E+06	1.25E+00	2.50E-01	3	4.39172E-01		
14	7.870E+08	4.85E+00	2.17E+02	1.133E+09	8.905E+00	9.39E+07	-1.29E+08	-1.64E+06	1.50E+00	2.50E-01	3	4.37118E-01		
15	1.097E+08	3.31E-01	1.85E+01	1.133E+09	8.901E+00	1.09E+07	-1.79E+07	-2.95E+05	1.75E+00	2.50E-01	3	4.36911E-01		
16	6.078E+06	-3.04E-03	2.15E+00	1.133E+09	8.900E+00	6.83E+05	-9.84E+05	-4.18E+04	2.00E+00	2.50E-01	3	4.36879E-01		
17	-1.336E+06	-3.22E-02	1.35E-01	1.133E+09	8.900E+00	-7.40E+04	-8.69E+04	-2.99E+03	2.25E+00	2.50E-01	3	4.36877E-01		

18	-2.506E+06	-4.57E-02	1.90E-02	1.133E+09	8.900E+00	-1.11E+05	4.41E+04	-8.13E+02	2.50E+00	2.50E-01	3	4.36877E-01
19	-2.506E+06	-4.56E-02	6.76E-11	1.133E+09	8.900E+00	-1.11E+05	5.16E+04	-8.93E+00	2.75E+00	2.50E-01	3	4.36877E-01
20	-2.506E+06	-4.59E-02	-4.40E-11	1.133E+09	8.900E+00	-1.11E+05	4.93E+04	-2.64E+02	3.00E+00	2.50E-01	3	4.36877E-01
21	-2.506E+06	-4.92E-02	-1.53E-02	1.133E+09	8.900E+00	-1.11E+05	1.78E+04	-6.14E+03	3.25E+00	2.50E-01	3	4.36877E-01
22	-2.506E+06	-8.82E-02	-1.21E-01	1.133E+09	8.900E+00	-7.31E+04	-2.08E+05	-1.48E+03	3.50E+00	2.50E-01	3	4.36877E-01
23	-1.531E+06	-2.32E-02	-4.85E-01	1.133E+09	8.900E+00	1.39E+05	-5.46E+05	-8.46E+02	3.75E+00	2.50E-01	3	4.36877E-01
24	5.595E+05	4.68E-03	-9.49E-01	1.133E+09	8.900E+00	-2.08E+03	-2.29E+04	0.0	4.00E+00	2.50E-01	1	1.43395E-10 3 4.36876E-01
25	1.013E+06	-3.27E-10	-5.25E-01	2.044E+09	1.225E-03	0.0	0.0	0.0	4.25E+00	2.50E-01	1	6.01317E-05
26	1.013E+06	-3.23E-03	-9.36E-12	2.044E+09	1.225E-03	0.0	0.0	0.0	4.50E+00	2.50E-01	1	6.01318E-05
27	1.013E+06	-3.49E-12	-7.06E-03	2.044E+09	1.225E-03	0.0	0.0	0.0	4.75E+00	2.50E-01	1	6.01319E-05
28	1.013E+06	0.0	0.0	2.044E+09	1.225E-03	0.0	0.0	0.0	5.00E+00	2.50E-01	1	6.01319E-05

ENERGY MAP

```
          1         2
                              ALTITUDE
   12345678901234567890
                               METERS
 1                          -1.750E-02
 2                          -1.500E-02
 3   B                      -1.250E-02
 4    B B   T  TT T T       -1.000E-02
 5     B BT B  BB B B       -7.500E-03
 6 TTTTTTT TTTTTTTTTTT      -5.000E-03
 7 BBBBBBB BB BB  BB        -2.500E-03
 8        B TB T B T  B     2.205E-08
 9          B  BB  BBB      2.500E-03
10 TTTT T                   5.000E-03
11       B                  7.500E-03
12     TTTTTTTTTTTTTTT      1.000E-02
13     B                    1.250E-02
14                          1.500E-02
15                          1.750E-02
16 B B                      2.000E-02
17   TB                     2.250E-02
18 T  T                     2.500E-02
19                          2.750E-02
20                          3.000E-02
21                          3.250E-02
22 B                        3.500E-02
23 TBBB                     3.750E-02
24   T  B                   4.000E-02
25 B B                      4.250E-02
26 T  T                     4.500E-02
27 B T                      4.750E-02
28   BB  BBBBBBBBBBBBB      5.000E-02
   12345678901234567890
          1         2
```

MATERIAL MAP


1 2
ALTITUDE
12345678901234567890
METERS
1 -1.750E-02
2 -1.500E-02
3 -1.250E-02
4 -1.000E-02
5 -7.500E-03
6 -5.000E-03
7 -2.500E-03
8 2.205E-08
9 2.500E-03
10 5.000E-03
11 7.500E-03
12 1.000E-02
13 1.250E-02
14 1.500E-02
15 1.750E-02
16 2.000E-02
17 2.250E-02
18 2.500E-02
19 2.750E-02
20 3.000E-02
21 3.250E-02
22 3.500E-02
23 3.750E-02
24 4.000E-02
25 4.250E-02
26 4.500E-02
27 4.750E-02
28 5.000E-02
12345678901234567890

```
                1         2
 *CYCLE     13   TIME 1.1417E-06  DT 1.445E-07   IDT    1  JDT    8
  CYCLE     14   TIME 1.2862E-06  DT 1.435E-07   IDT    5  JDT    9
  CYCLE     15   TIME 1.4297E-06  DT 1.413E-07   IDT    5  JDT    9
  CYCLE     16   TIME 1.5710E-06  DT 1.413E-07   IDT    5  JDT    9
  CYCLE     17   TIME 1.7122E-06  DT 1.419E-07   IDT    6  JDT    9
  CYCLE     18   TIME 1.8541E-06  DT 8.024E-08   IDT    6  JDT    9
  CYCLE     19   TIME 1.9343E-06  DT 6.565E-08   IDT    6  JDT   10
  CYCLE     20   TIME 2.0000E-06  DT 1.421E-07   IDT    6  JDT   10


**********
**********

PROB    1.2000     CYCLE    20     TIME  1.999999E-06     DT  1.420903E-07


     INTERNAL ENERGY          KINETIC ENERGY          TOTAL ENERGY              ETH                REL ERROR
   1.30154391      E+12    2.46099781      E+13    2.59115209      E+13    2.59102626      E+13    6.28096466      E+01

                                                    TOTAL MASS                MTH                RELMERR
                                                   6.69469727      E+02    6.69467285      E+02    2.91743088      E+00

MAX VEL =  3.34810E+05 AT I   6 J  11

MAX CS =   5.88557E+05 AT I   1 J   7

MAX TEMP=   4.48757E+03 AT I   5 J  11

MAX P =   5.43274E+11 AT I   1 J  12

CELL SETTING DT, I   6 J  10


TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN, 33 SEC

TIME FOR THIS RUN     0 HOURS,  0 MIN, 33 SEC
WHIZ FACTOR TOTAL PROBLEM   = 2.99E-03 SEC/CELL/CYCLE
WHIZ FACTOR SINCE LAST DUMP = 3.06E-03 SEC/CELL/CYCLE


I=   1  X(I)=     0.250   DX(I)=    0.250
 J       P         U         V         XI         RHO        SRR        SZZ        SRZ         Y         DY     M      XM      M      XM

  1  1.013E+06  0.0       3.00E+05 2.044E+09 1.225E-03  0.0        0.0        0.0       -1.75E+00 2.50E-01 1 6.01319E-05
  2  1.013E+06 -8.53E-03  3.00E+05 2.044E+09 1.225E-03  0.0        0.0        0.0       -1.50E+00 2.50E-01 1 6.01325E-05
  3  1.014E+06  6.13E-02  3.00E+05 2.045E+09 1.225E-03  0.0        0.0        0.0       -1.25E+00 2.50E-01 1 6.01373E-05
  4  1.020E+06  1.66E-01  3.00E+05 2.048E+09 1.231E-03  0.0        0.0        0.0       -1.00E+00 2.50E-01 1 6.04079E-05
  5  1.338E+06 -5.31E-01  2.98E+05 2.203E+09 1.504E-03  0.0        0.0        0.0       -7.50E-01 2.50E-01 1 7.38463E-05
```

6	3.638E+06	3.12E+02	1.71E+05	7.489E+09	1.626E+00	1.24E+09	-2.31E+09	0.0	-5.00E-01	2.50E-01	1	7.00830E-05	2	7.97600E-02
7	2.473E+11	3.41E+03	1.06E+05	7.237E+09	8.528E+00	6.81E+08	-2.66E+09	6.05E+08	-2.50E-01	2.50E-01	2	4.18616E-01		
8	2.135E+11	7.76E+03	1.32E+05	7.652E+09	8.385E+00	8.46E+08	-2.48E+09	1.10E+09	2.21E-06	2.50E-01	2	4.11611E-01		
9	1.366E+11	1.18E+04	1.34E+05	5.607E+09	8.199E+00	1.78E+09	-2.84E+09	3.63E+08	2.50E-01	2.50E-01	2	4.02473E-01		
10	2.631E+11	1.27E+04	1.27E+05	9.278E+09	9.364E+00	0.0	0.0	0.0	5.00E-01	2.50E-01	2	6.13923E-02	3	3.98244E-01
11	4.678E+11	9.86E+03	1.36E+05	1.017E+10	1.044E+01	5.45E+07	-1.26E+08	-1.63E+07	7.50E-01	2.50E-01	3	5.12335E-01		
12	5.416E+11	5.02E+03	1.25E+05	9.071E+09	1.086E+01	1.28E+08	-2.86E+08	-2.61E+07	1.00E+00	2.50E-01	3	5.33292E-01		
13	3.405E+11	1.57E+03	7.30E+04	5.077E+09	1.034E+01	2.41E+08	-4.85E+08	-2.36E+07	1.25E+00	2.50E-01	3	5.07450E-01		
14	1.048E+11	3.15E+02	2.52E+04	1.826E+09	9.448E+00	2.83E+08	-5.20E+08	-1.26E+07	1.50E+00	2.50E-01	3	4.63796E-01		
15	2.285E+10	8.49E+01	5.40E+03	1.175E+09	9.036E+00	3.00E+08	-5.31E+08	-6.21E+06	1.75E+00	2.50E-01	3	4.43568E-01		
16	3.976E+09	3.69E+01	1.04E+03	1.135E+09	8.925E+00	3.31E+08	-5.27E+08	-9.39E+06	2.00E+00	2.50E-01	3	4.38083E-01		
17	7.277E+08	5.19E+00	1.78E+02	1.133E+09	8.905E+00	1.02E+08	-1.67E+08	-4.33E+06	2.25E+00	2.50E-01	3	4.37100E-01		
18	1.118E+08	7.33E-01	3.02E+01	1.133E+09	8.901E+00	1.46E+07	-2.32E+07	-6.43E+05	2.50E+00	2.50E-01	3	4.36912E-01		
19	1.778E+07	-1.19E-01	4.00E+00	1.133E+09	8.900E+00	1.64E+06	-3.28E+06	-8.78E+04	2.75E+00	2.50E-01	3	4.36883E-01		
20	2.176E+06	-1.89E-01	5.06E-01	1.133E+09	8.900E+00	-2.71E+05	-8.21E+04	-2.83E+04	3.00E+00	2.50E-01	3	4.36878E-01		
21	4.201E+05	-2.13E-01	-2.27E-01	1.133E+09	8.900E+00	-4.24E+05	-1.65E+04	-2.14E+04	3.25E+00	2.50E-01	3	4.36878E-01		
22	1.005E+06	-2.35E-01	-5.37E-01	1.133E+09	8.900E+00	-3.16E+05	-4.45E+05	2.08E+05	3.50E+00	2.50E-01	3	4.36878E-01		
23	1.005E+06	-7.59E-02	-6.06E-01	1.133E+09	8.900E+00	1.51E+05	-1.38E+06	1.33E+05	3.75E+00	2.50E-01	3	4.36878E-01		
24	8.372E+05	1.81E-02	-1.11E+00	1.133E+09	8.900E+00	-2.08E+03	-2.29E+04	0.0	4.00E+00	2.50E-01	1	4.11852E-10	3	4.36874E-01
25	1.013E+06	-9.60E-03	-6.67E-01	2.044E+09	1.225E-03	0.0	0.0	0.0	4.25E+00	2.50E-01	1	6.01314E-05		
26	1.013E+06	-1.66E-02	-1.34E-02	2.044E+09	1.225E-03	0.0	0.0	0.0	4.50E+00	2.50E-01	1	6.01316E-05		
27	1.013E+06	-9.04E-03	-2.91E-02	2.044E+09	1.225E-03	0.0	0.0	0.0	4.75E+00	2.50E-01	1	6.01319E-05		
28	1.013E+06	0.0	0.0	2.044E+09	1.225E-03	0.0	0.0	0.0	5.00E+00	2.50E-01	1	6.01319E-05		

ENERGY MAP


```
          1         2
                                ALTITUDE
  12345678901234567890
                                METERS
 1                              -1.750E-02
 2                              -1.500E-02
 3   B                          -1.250E-02
 4    B                         -1.000E-02
 5     BBB                      -7.500E-03
 6        T  T                  -5.000E-03
 7 TT   TTT TT TTTTTTTT         -2.500E-03
 8 BB   BBBBBB                   2.205E-08
 9 TTT    @   BBBBBBBBB         2.500E-03
10 BBB    TT                    5.000E-03
11   TT TT B                    7.500E-03
12 TT  TBBB                     1.000E-02
13      TTTTTTTTTTTTTT          1.250E-02
14                              1.500E-02
15                              1.750E-02
16     B                        2.000E-02
17       BBBBBBBBBBBBBB         2.250E-02
18                              2.500E-02
19 BBB                          2.750E-02
20                              3.000E-02
21  TT T                        3.250E-02
```

```
22 TBB                    3.500E-02
23    BB                  3.750E-02
24 BTT TB                 4.000E-02
25  BB B                  4.250E-02
26 T  T                   4.500E-02
27 B T                    4.750E-02
28   BB                   5.000E-02
   12345678901234567890
            1         2
```

MATERIAL MAP

```
            1         2
                          ALTITUDE
   12345678901234567890
                           METERS
 1 ++++++++++++++++++++ -1.750E-02
 2 ++++++++++++++++++++ -1.500E-02
 3 ++++++++++++++++++++ -1.250E-02
 4 ++++++++++++++++++++ -1.000E-02
 5 ++++++++++++++++++++ -7.500E-03
 6 ++++++++++++++++++++ -5.000E-03
   XXXX
 7 XXXX++++++++++++++++ -2.500E-03
      XXXXXXXXXXXXXXXX
 8 XXXXXXXXXXXXXXXXXXX  2.205E-08
 9 XXXX+XXXXXXXXXXXXX++  2.500E-03
    0X              XX
10 XXX0XXXXXXXXXXXXXXX  5.000E-03
   000 0
11 0000++++++++++++++++  7.500E-03
      XXXXXXXXXXXXXXXX
      0
12 0000++++++++++++++++  1.000E-02
      0
13 0000++++++++++++++++  1.250E-02
      0
14 0000++++++++++++++++  1.500E-02
      0
15 0000++++++++++++++++  1.750E-02
      0
16 0000++++++++++++++++  2.000E-02
      0
17 0000++++++++++++++++  2.250E-02
      0
18 0000++++++++++++++++  2.500E-02
      0
19 000+++++++++++++++++  2.750E-02
     0
20 000+++++++++++++++++  3.000E-02
     0
```

```
21 000++++++++++++++++++  3.250E-02
     0
22 000++++++++++++++++++  3.500E-02
     0
23 000++++++++++++++++++  3.750E-02
     0
24 ++++++++++++++++++++  4.000E-02
   0000
25 ++++++++++++++++++++  4.250E-02
26 ++++++++++++++++++++  4.500E-02
27 ++++++++++++++++++++  4.750E-02
28 ++++++++++++++++++++  5.000E-02
   12345678901234567890
             1         2
  CYCLE    21   TIME 2.1421E-06  DT 1.409E-07   IDT    6  JDT   10
  CYCLE    22   TIME 2.2830E-06  DT 1.416E-07   IDT    6  JDT   10
  CYCLE    23   TIME 2.4246E-06  DT 1.443E-07   IDT    6  JDT   10
  CYCLE    24   TIME 2.5689E-06  DT 1.482E-07   IDT    7  JDT   10
IN EOS, HIT NTRY LIMIT
  CYCLE    25   TIME 2.7172E-06  DT 1.556E-07   IDT    7  JDT   10
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  10 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
  CYCLE    26   TIME 2.8727E-06  DT 1.273E-07   IDT    7  JDT   11
  CYCLE    27   TIME 3.0000E-06  DT 1.484E-07   IDT    7  JDT   11
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  10 FORMING DPDTAU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PROB    1.2000     CYCLE    27     TIME  2.999998E-06     DT  1.483527E-07


     INTERNAL ENERGY          KINETIC ENERGY          TOTAL ENERGY              ETH              REL ERROR
   1.37784564      E+12    2.45365610      E+13    2.59144066      E+13    2.59114538      E+13    6.53926239      E+01

                                                    TOTAL MASS              MTH              RELMERR
                                                  6.69496826      E+02    6.69492676      E+02    2.55264834      E+00

MAX VEL =  3.40383E+05 AT I   6 J  13

MAX CS =   5.14824E+05 AT I   1 J  14

MAX TEMP=  7.47932E+03 AT I   5 J  11

MAX P =   3.06779E+11 AT I   1 J  14
```

CELL SETTING DT, I 7 J 11

TOTAL TIME FOR THIS PROBLEM   0 HOURS, 0 MIN, 45 SEC

TIME FOR THIS RUN   0 HOURS, 0 MIN, 45 SEC
WHIZ FACTOR TOTAL PROBLEM   = 3.03E-03 SEC/CELL/CYCLE
WHIZ FACTOR SINCE LAST DUMP = 3.19E-03 SEC/CELL/CYCLE

I= 1 X(I)= 0.250 DX(I)= 0.250

J	P	U	V	XI	RHO	SRR	SZZ	SRZ	Y	DY	M	XM	M	XM
1	1.013E+06	0.0	3.00E+05	2.044E+09	1.225E-03	0.0	0.0	0.0	-1.75E+00	2.50E-01	1	6.01319E-05		
2	1.013E+06	-2.05E-02	3.00E+05	2.044E+09	1.225E-03	0.0	0.0	0.0	-1.50E+00	2.50E-01	1	6.01327E-05		
3	1.014E+06	-2.05E-02	3.00E+05	2.045E+09	1.226E-03	0.0	0.0	0.0	-1.25E+00	2.50E-01	1	6.01606E-05		
4	1.019E+06	6.88E-02	3.00E+05	2.048E+09	1.230E-03	0.0	0.0	0.0	-1.00E+00	2.50E-01	1	6.03881E-05		
5	1.696E+06	8.82E+00	2.97E+05	2.478E+09	1.701E-03	0.0	0.0	0.0	-7.50E-01	2.50E-01	1	8.35190E-05		
6	6.991E+06	3.81E+02	1.86E+05	8.097E+09	2.309E-03	0.0	0.0	0.0	-5.00E-01	2.50E-01	1	1.13319E-04		
7	4.633E+06	2.54E+03	9.98E+04	6.652E+09	5.848E+00	-2.23E+09	-2.70E+08	0.0	-2.50E-01	2.50E-01	1	1.84442E-05	2	2.87025E-01
8	-1.100E+11	6.64E+03	1.29E+05	7.091E+09	6.984E+00	1.09E+09	8.88E+08	1.32E+09	2.21E-06	2.50E-01	2	3.42839E-01		
9	-9.691E+10	7.53E+03	1.21E+05	6.268E+09	7.172E+00	1.69E+09	-2.79E+09	3.06E+08	2.50E-01	2.50E-01	2	3.52067E-01		

IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J = 28 FORMING DPDTAU

10	1.082E+06	1.20E+04	1.02E+05	6.510E+09	7.335E+00	0.0	0.0	0.0	5.00E-01	2.50E-01	3	1.53310E-01	2	2.06748E-01
11	0.0	1.39E+04	8.73E+04	6.909E+09	7.956E+00	0.0	0.0	0.0	7.50E-01	2.50E-01	3	3.90515E-01		
12	1.507E+10	1.24E+04	8.16E+04	5.259E+09	8.566E+00	7.60E+07	-1.32E+08	-9.74E+06	1.00E+00	2.50E-01	3	4.20503E-01		
13	1.604E+11	9.54E+03	8.80E+04	4.758E+09	9.449E+00	1.93E+08	-4.27E+08	-5.69E+07	1.25E+00	2.50E-01	3	4.63834E-01		
14	2.765E+11	5.73E+03	8.70E+04	4.696E+09	1.006E+01	2.00E+08	-4.81E+08	-4.86E+07	1.50E+00	2.50E-01	3	4.93990E-01		
15	2.378E+11	2.38E+03	6.13E+04	3.392E+09	1.000E+01	2.36E+08	-5.00E+08	-3.37E+07	1.75E+00	2.50E-01	3	4.90890E-01		
16	1.087E+11	6.42E+02	2.75E+04	1.763E+09	9.477E+00	2.84E+08	-5.21E+08	-2.20E+07	2.00E+00	2.50E-01	3	4.65218E-01		
17	3.282E+10	1.67E+02	8.13E+03	1.203E+09	9.094E+00	3.12E+08	-5.29E+08	-1.26E+07	2.25E+00	2.50E-01	3	4.46392E-01		
18	7.823E+09	6.82E+01	1.97E+03	1.137E+09	8.948E+00	3.32E+08	-5.27E+08	-1.15E+07	2.50E+00	2.50E-01	3	4.39238E-01		
19	1.775E+09	1.78E+01	4.44E+02	1.134E+09	8.911E+00	2.67E+08	-4.23E+08	-1.29E+07	2.75E+00	2.50E-01	3	4.37419E-01		
20	3.833E+08	3.58E+00	9.76E+01	1.133E+09	8.902E+00	5.34E+07	-8.34E+07	-2.35E+06	3.00E+00	2.50E-01	3	4.36995E-01		
21	8.432E+07	1.51E-01	1.81E+01	1.133E+09	8.901E+00	9.40E+06	-1.63E+07	-3.18E+05	3.25E+00	2.50E-01	3	4.36903E-01		
22	1.759E+07	-3.06E-01	2.65E+00	1.133E+09	8.900E+00	6.66E+05	-2.81E+06	6.45E+04	3.50E+00	2.50E-01	3	4.36883E-01		
23	8.809E+06	-7.75E-01	4.31E-01	1.133E+09	8.900E+00	-4.14E+05	-1.41E+06	-4.55E+04	3.75E+00	2.50E-01	3	4.36880E-01		
24	1.009E+06	8.42E-03	-3.07E-01	1.133E+09	8.900E+00	-2.08E+03	-2.29E+04	0.0	4.00E+00	2.50E-01	1	5.96303E-10	3	4.36873E-01
25	1.013E+06	-1.96E-02	-7.19E-01	2.044E+09	1.225E-03	0.0	0.0	0.0	4.25E+00	2.50E-01	1	6.01311E-05		
26	1.013E+06	-3.62E-02	-3.89E-02	2.044E+09	1.225E-03	0.0	0.0	0.0	4.50E+00	2.50E-01	1	6.01315E-05		
27	1.013E+06	-2.09E-02	-6.41E-02	2.044E+09	1.225E-03	0.0	0.0	0.0	4.75E+00	2.50E-01	1	6.01319E-05		
28	1.013E+06	0.0	0.0	2.044E+09	1.225E-03	0.0	0.0	0.0	5.00E+00	2.50E-01	1	6.01319E-05		

ENERGY MAP

1 2

ALTITUDE

```
   12345678901234567890
                                  METERS
 1                              -1.750E-02
 2                              -1.500E-02
 3   B                          -1.250E-02
 4    B                         -1.000E-02
 5     BBB                      -7.500E-03
 6           T                  -5.000E-03
 7 TTTT          TT            -2.500E-03
 8 BBBBTTTTTTT TT  TTTT         2.205E-08
 9 TT  BBBBBBBBBBBBBBB          2.500E-03
10 BB                           5.000E-03
11    T    TT                   7.500E-03
12 TTT   TT                     1.000E-02
13     T BBBB                   1.250E-02
14       TTTTTTTTTTTTT          1.500E-02
15      T                       1.750E-02
16                              2.000E-02
17                              2.250E-02
18     B                        2.500E-02
19                              2.750E-02
20       B                      3.000E-02
21                              3.250E-02
22  BBB                         3.500E-02
23  T    T                      3.750E-02
24 B TTTBB                      4.000E-02
25  BBBB T                      4.250E-02
26 T                            4.500E-02
27 B TT                         4.750E-02
28   BB  BBBBBBBBBBBBB          5.000E-02
   12345678901234567890
            1         2
```

MATERIAL MAP

```
            1         2
                                  ALTITUDE
   12345678901234567890
                                  METERS
 1 ++++++++++++++++++++ -1.750E-02
 2 ++++++++++++++++++++ -1.500E-02
 3 ++++++++++++++++++++ -1.250E-02
 4 ++++++++++++++++++++ -1.000E-02
 5 ++++++++++++++++++++ -7.500E-03
 6 ++++++++++++++++++++ -5.000E-03
 7 ++++++++++++++++++++ -2.500E-03
   XXXXX
 8 XXXX++++++++++++++++  2.205E-08
       XXXXXXXXXXXXXXX
 9 XXXX+XXXXXXXXXXXX++  2.500E-03
       X             XX
```

```
10 +++XXXXXXXXXXXXXXXX  5.000E-03
   XXXOO
   OOO
11 OOOO++XXXXXXXXXXXXX  7.500E-03
      XX
      O
12 OOOO+++++++++++++++  1.000E-02
      OXXXXXXXXXXXXXX
       O
13 OOOO+++++++++++++++  1.250E-02
      OX
       O
14 OOOO+++++++++++++++  1.500E-02
      O
15 OOOO+++++++++++++++  1.750E-02
      O
16 OOOO+++++++++++++++  2.000E-02
      O
17 OOOO+++++++++++++++  2.250E-02
      O
18 OOOO+++++++++++++++  2.500E-02
      O
19 OOOO+++++++++++++++  2.750E-02
      O
20 OOOO+++++++++++++++  3.000E-02
      O
21 OOOO+++++++++++++++  3.250E-02
      O
22 OOO+++++++++++++++++  3.500E-02
      O
23 OOO+++++++++++++++++  3.750E-02
      O
24 ++++++++++++++++++++  4.000E-02
   OOOO
25 ++++++++++++++++++++  4.250E-02
26 ++++++++++++++++++++  4.500E-02
27 ++++++++++++++++++++  4.750E-02
28 ++++++++++++++++++++  5.000E-02
   12345678901234567890
             1         2
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  10 FORMING DPDTAU
   CYCLE    28   TIME 3.1484E-06  DT 1.493E-07   IDT    7  JDT   11
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  10 FORMING DPDTAU
   CYCLE    29   TIME 3.2976E-06  DT 1.519E-07   IDT    7  JDT   11
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
```

PROB 1.2000 CYCLE 118 TIME 1.599999E-05 DT 1.632141E-07

INTERNAL ENERGY		KINETIC ENERGY		TOTAL ENERGY		ETH		REL ERROR	
1.90022314	E+12	2.20529458	E+13	2.39531668	E+13	2.39732324	E+13	-2.41585907	E+02

TOTAL MASS		MTH		RELMERR	
6.28324463	E+02	6.28282471	E+02	6.60553837	E+00

MAX VEL = 3.01340E+05 AT I 12 J 27

MAX CS = 4.85176E+05 AT I 9 J 23

MAX TEMP= 3.79498E+03 AT I 20 J 27

MAX P = 6.11026E+10 AT I 1 J 21

CELL SETTING DT, I 10 J 27

TOTAL TIME FOR THIS PROBLEM 0 HOURS, 4 MIN, 7 SEC

TIME FOR THIS RUN 0 HOURS, 4 MIN, 7 SEC

OWHIZ FACTOR TOTAL PROBLEM = 3.74E-03 SEC/CELL/CYCLE

OWHIZ FACTOR SINCE LAST DUMP = 4.23E-03 SEC/CELL/CYCLE

OI= 1 X(I)= 0.250 DX(I)= 0.250

O J	P	U	V	XI	RHO	SRR	SZZ	SRZ	Y	DY	M	XM	M	XM
1	1.013E+06	0.0	3.00E+05	2.044E+09	1.225E-03	0.0	0.0	0.0	-1.75E+00	2.50E-01	1	6.01319E-05		
2	1.013E+06	-3.09E-02	3.00E+05	2.044E+09	1.225E-03	0.0	0.0	0.0	-1.50E+00	2.50E-01	1	6.01322E-05		
3	1.013E+06	-4.35E-02	3.00E+05	2.045E+09	1.225E-03	0.0	0.0	0.0	-1.25E+00	2.50E-01	1	6.01325E-05		
4	1.014E+06	-1.71E-01	3.00E+05	2.045E+09	1.225E-03	0.0	0.0	0.0	-1.00E+00	2.50E-01	1	6.01335E-05		
5	1.014E+06	-3.63E-01	3.00E+05	2.045E+09	1.225E-03	0.0	0.0	0.0	-7.50E-01	2.50E-01	1	6.01417E-05		
6	1.015E+06	-7.92E-01	3.00E+05	2.046E+09	1.226E-03	0.0	0.0	0.0	-5.00E-01	2.50E-01	1	6.01926E-05		
7	1.023E+06	-3.82E+00	3.00E+05	2.052E+09	1.232E-03	0.0	0.0	0.0	-2.50E-01	2.50E-01	1	6.04783E-05		
8	1.063E+06	-2.92E+01	2.99E+05	2.087E+09	1.260E-03	0.0	0.0	0.0	[illegible].21E-06	2.50E-01	1	6.18319E-05		
9	1.291E+06	-2.15E+02	2.94E+05	2.348E+09	1.365E-03	0.0	0.0	0.0	2.50E-01	2.50E-01	1	6.69822E-05		
10	2.499E+06	-9.61E+02	2.77E+05	3.780E+09	1.673E-03	0.0	0.0	0.0	5.00E-01	2.50E-01	1	8.21043E-05		
11	6.944E+06	-1.71E+03	2.39E+05	7.701E+09	2.399E-03	0.0	0.0	0.0	7.50E-01	2.50E-01	1	1.17741E-04		
12	1.684E+07	2.12E+02	1.91E+05	1.229E+10	3.842E-03	0.0	0.0	0.0	1.00E+00	2.50E-01	1	1.88586E-04		
13	1.919E+07	3.01E+03	1.36E+05	1.382E+10	3.953E-03	0.0	0.0	0.0	1.25E+00	2.50E-01	1	1.94034E-04		
14	1.759E+07	3.57E+03	1.16E+05	8.468E+09	5.576E+00	5.79E+08	-1.74E+09	0.0	1.50E+00	2.50E-01	1	4.57187E-05	2	2.73649E-01
15	6.958E+04	3.26E+03	1.09E+05	8.824E+09	5.784E+00	4.42E+08	-1.53E+09	0.0	1.75E+00	2.50E-01	1	7.28162E-07	2	2.83934E-01
16	1.902E+05	-6.35E+03	5.40E+04	7.998E+09	7.713E+00	0.0	0.0	0.0	2.00E+00	2.50E-01	3	3.53642E-01	2	2.49901E-02
17	1.588E+10	-9.22E+01	4.50E+04	5.700E+09	8.529E+00	2.05E+07	-3.94E+07	2.11E+07	2.25E+00	2.50E-01	3	4.18690E-01		
18	3.316E+10	9.84E+02	3.56E+04	3.514E+09	8.845E+00	2.34E+08	-4.82E+08	2.50E+07	2.50E+00	2.50E-01	3	4.34160E-01		

```
 19  3.845E+10  7.23E+02  2.50E+04 2.228E+09 9.016E+00  2.57E+08 -5.10E+08 -1.60E+06  2.75E+00 2.50E-01 3 4.42551E-01
 20  4.913E+10  1.11E+03  1.31E+04 1.684E+09 9.139E+00  2.55E+08 -5.22E+08  3.16E+05  3.00E+00 2.50E-01 3 4.48614E-01
 21  6.214E+10  5.68E+02  5.50E+03 1.548E+09 9.231E+00  2.18E+08 -5.22E+08  3.00E+07  3.25E+00 2.50E-01 3 4.53135E-01
 22  4.598E+10  1.32E+03  2.87E+03 1.427E+09 9.148E+00  2.08E+08 -4.87E+08  1.72E+08  3.50E+00 2.50E-01 3 4.49068E-01
 23  5.041E+10  8.80E+02  9.51E+03 1.460E+09 9.171E+00 -4.67E+08  4.33E+08 -6.63E+07  3.75E+00 2.50E-01 3 4.50191E-01
 24  2.366E+10  2.56E+02  1.63E+04 1.341E+09 9.023E+00 -1.55E+08  5.13E+08  4.58E+07  4.00E+00 2.50E-01 3 4.42909E-01
 25  8.967E+05  7.15E+02  1.52E+04 1.341E+09 1.120E+00 -6.93E+07  3.57E+08  0.0       4.25E+00 2.50E-01 1 4.14071E-05 3 5.49376E-02
 26  1.317E+06 -1.28E+02  4.65E+03 2.255E+09 1.448E-03  0.0       0.0       0.0       4.50E+00 2.50E-01 1 7.10745E-05
 27  1.078E+06 -4.50E+01  2.20E+03 2.084E+09 1.279E-03  0.0       0.0       0.0       4.75E+00 2.50E-01 1 6.27861E-05
 28  1.013E+06  0.0       0.0      2.044E+09 1.225E-03  0.0       0.0       0.0       5.00E+00 2.50E-01 1 6.01319E-05
0                                                    ENERGY MAP

61

                1         2
+                        ALTITUDE
    12345678901234567890
+                        METERS
   1                    -1.750E-02
   2                    -1.500E-02
   3                    -1.250E-02
   4                    -1.000E-02
   5  B                 -7.500E-03
   6   B                -5.000E-03
   7    B               -2.500E-03
   8     BB              2.205E-08
```

```
 9                          2.500E-03
10                          5.000E-03
11                          7.500E-03
12                          1.000E-02
13                          1.250E-02
14 TTTTT                    1.500E-02
15 BBBBBT                   1.750E-02
16 TTTT BT                  2.000E-02
17     T B                  2.250E-02
18       T                  2.500E-02
19       BT                 2.750E-02
20       TB                 3.000E-02
21       B T                3.250E-02
22        TBT               3.500E-02
23 B     T T TT  T T        3.750E-02
24 T BBB       TT T TT      4.000E-02
25  B T       BBBBBBB       4.250E-02
26 B  B       T      B      4.500E-02
27 TTTTT  B    TTTT         4.750E-02
28      TTT  BBBBBBB        5.000E-02
   12345678901234567890
            1         2
```

0 MATERIAL MAP

```
            1         2
```


+ ALTITUDE
12345678901234567890
+ METERS
1 ++++++++++++++++++++ -1.750E-02
2 ++++++++++++++++++++ -1.500E-02
3 ++++++++++++++++++++ -1.250E-02
4 ++++++++++++++++++++ -1.000E-02
5 ++++++++++++++++++++ -7.500E-03
6 ++++++++++++++++++++ -5.000E-03
7 ++++++++++++++++++++ -2.500E-03
8 ++++++++++++++++++++ 2.205E-08
9 ++++++++++++++++++++ 2.500E-03
10 ++++++++++++++++++++ 5.000E-03
11 ++++++++++++++++++++ 7.500E-03
12 ++++++++++++++++++++ 1.000E-02
13 ++++++++++++++++++++ 1.250E-02
14 ++++++++++++++++++++ 1.500E-02
+ XXXXX
+ 0
15 ++++++++++++++++++++ 1.750E-02
+ XXXXXX
+ 00 0
16 +0++++++++++++++++++ 2.000E-02
+ X XXXXXX
+ 0 0000
17 0000++++++++++++++++ 2.250E-02
+ 0XXX
+ 00
18 0000++++++++++++++++ 2.500E-02
+ 00XX
+ 0
19 0000++++++++++++++++ 2.750E-02
+ 00XXX
+ 00
20 0000+++X++++++++++++ 3.000E-02
+ 0 00X
21 0000++++++++++++++++ 3.250E-02
+ 0 0XXX
+ 00
22 0000++++++++++++++++ 3.500E-02
+ 0 00XX
+ 0
23 0000++++X++++++++++ 3.750E-02
+ 0 X XXXX
+ 0
24 0000++++XXXX++++++++ 4.000E-02
+ 0 X XXXXXXXX
25 ++++++++XXXXXXXXXXX 4.250E-02
+ 0000 X
26 ++++++++XXXXXXXXXXX 4.500E-02
+ X

```
  27 +++++++++XXXXXXXXXX  4.750E-02
+            X
  28 ++++++++++++++++++++  5.000E-02
     12345678901234567890
               1         2
■!
EDIT
```

PROBLEM 1.2 CYBER 176 HULL RUN

```
BATCH       CREATED 08/19/78  TODAY IS 08/21/78
  AUTOMATIC BULLETIN TO BATCH JOBS
+
```

	SYSBULL	CONTENTS
8/18/78	STATUS	AVAILABILITY STATUS OF ALL SYSTEMS
8/ 9/78	MEMMGT	CM AND ECS FIELD MANAGEMENT
7/31/78	NASTRAN	INFORMATION FOR USERS OF NASTRAN
7/18/78	CONTACT	WHO TO CONTACT ABOUT COMPUTER PROBLEMS
7/14/78	MODS	FEATURES ADDED TO CDC NOS/BE
7/14/78	CMECMGT	CM AND ECS FIELD LENGTH MANAGEMENT
6/23/78	FLECS	STRUCTURED PROGRAMMING PRE-PROCESSOR FOR FTN
6/20/78	LETTER	AFWL COMPUTER CENTER NEWSLETTER
6/14/78	ASPLIB	AFWL COMMON MATH LIBRARIES
5/16/78	CLASS	CLASSES FOR USERS OF AFWL COMPUTER CENTER
5/ 8/78	ACCESS	HOW TO OBTAIN AN AFWL/KAFB COMPUTER ACCOUNT
5/ 4/78	CONFIG	SYSTEMS CONFIGURATION
5/ 4/78	EXPDITE	AFWR CUSTOMER SERVICE (EXPEDITOR)
5/ 1/78	PRIORTY	JOB CARD PRIORITY CODES
4/24/78	BILLING	AFWL COMPUTER BILLING INFORMATION
4/21/78	DIALUP	COMPUTER DIALUP PHONE NUMBERS
4/19/78	INTRO	BASIC INTRODUCTION TO KAFB COMPUTER CENTER
4/18/78	DUMPS	STANDARD PROCEDURES FOR ERROR DUMPS
4/14/78	TITLE	MICROFICHE VISUAL TITLE GENERATION
4/11/78	REQUEST	STANDARD PROCEDURES FOR REQUESTING TAPES
4/ 6/78	PLOT	DEVICE INDEPENDENT PLOT SYSTEM -METAPLOT-
3/31/78	ACCOUNT	ACCOUNT CARD FORMAT.
3/30/78	PFRULES	LOCAL RULES FOR CATALOGING FILES
3/30/78	BACKUP	PERMANENT FILE BACKUP PROCEDURES
3/30/78	PRMFILE	PERM FILE ACCOUNTING AND BACKUP SYSTEMS
3/ 9/78	LABEL	AFWL LABELLED TAPE PROCESSING
3/ 9/78	FR80	280 SIMULATION VIA FR80
3/ 9/78	COMPILE	FTN COMPILER CHANGES AND RELEASES
3/ 8/78	AFSCNET	INFORMATION ABOUT AFSCNET
3/ 7/78	METAQUE	AUTOMATIC DISPOSITION OF META PLOT FILES
2/10/78	SWITCH	NEW INTERCOM PHONE SWITCH
1/17/78	DIFFER	DIFFERENCES IN NOS/BE FROM 6600 TO CYBER 176
1/ 4/78	DISSTIP	DISSPLA TECH. INFO. PROGRAMMING SUGGESTIONS
10/ 3/77	DISSPLA	A NEW USER ORIENTED PLOTING PACKAGE

SYSTEM WARNINGS

8/16/78	** BUDGETARY CONSIDERATION FOR FY 79: 176 CHARGES WILL GO UP BY ABOUT 15%.
8/16/78	REVIEW, SIGN AND RETURN TAPE INVENTORY LISTINGS BEFORE 21 AUGUST 1978.
8/16/78	+++++ FLASH MESSAGE +++++ CYBER RECORD MANAGER ANALYSIS CLASS HAS BEEN
8/16/78	+++++ CHANGED TO AUG 28-30. ALL CLASS MEMBERS TAKE NOTE ++++ FLASH +++
8/16/78	** ** NOTICE TO CONTRACTORS ** CONTRACTOR WORK AREA IN ROOM 110 OF BLDG
8/16/78	** 412 WILL NOT BE AVAILABLE AFTER 28 AUG 78. THIS WILL BE THE NEW
8/16/78	** PCAM AREA. PLEASE REMOVE ALL LISTINGS OR CARD DECKS STORED THERE.
8/16/78	

```
NOT ENOUGH RESOURCES.  I COULD ONLY PROVIDE   0
+
TAPE4 SEMAC FOR START CYCLE
```

+
+
CU PENETRATOR
+
+
PROB 1.2000 CYCLE 0 TIME 0.
BACKSPACING 2 RECORDS
TAPE POSITIONED
+
DISK VERSION
+
+
+
+
+
***** OPTIONS SELECTED FOR THIS RUN *****
+
DIFFERENCE METHOD -

SHELL II

AND MATERIAL STRENGTH

WITH 6 FLUXED HISTORIES/CELL

EQUATION OF STATE -

SOLIDS - NO STRENGTH

ATMOSPHERE -

CONSTANT

VOLUME AND ENERGY FLUXING

REZONE -

NO REZONE

CODE -

HULL

DIMENSIONS -

2-D

GEOMETRY -

CYLINDRICAL

NO RADIATION ROUTINES

PARTICLES -

NO CODE

THE FOLLOWING OPTIONS WERE DEFINED BY PLANK.

+

ATMOS	=	5
BURN	=	0
CODE	=	1
DIMEN	=	2
EOS	=	6
GEOM	=	2
HOT	=	0
IMAX	=	20
ISLAND	=	0
JMAX	=	28
KMAX	=	1
LBUFA	=	1729
LBUFB	=	122
MAGFLD	=	0
METHOD	=	2
NH	=	20
NHIC	=	1600
NM	=	3
NOP	=	0
NHIST	=	6
NPLPB	=	2
NPP	=	2
NROWPB	=	4
NSTN	=	0
NVARST	=	15
RAD	=	0
REZONE	=	0
STRESS	=	1
SURF	=	0
SW	=	6
SWX	=	0
VISC	=	0
LAMB	=	0
BBOUND	=	0
LBOUND	=	0
KEEL	=	0
PULL	=	0
VOIDS	=	0
FLUXER	=	3
DEPOS	=	0
FAIL	=	0
STRAIN	=	1
WORK	=	0
MAT	=	3
AIR	=	1
CU	=	3
FE	=	2

THE FOLLOWING OPTIONS WERE SPECIFIED WHEN EXECUTIVE PROCESSING BEGAN

INST	=	1
PRG	=	0
PLANK	=	0
PULL	=	0
KEEL	=	0
LIBRARY	=	0
ATMOS	=	5
BURN	=	0
CODE	=	1
DIMEN	=	2
EOS	=	6
GEOM	=	2
HOT	=	0
IMAX	=	20
ISLAND	=	0
JMAX	=	28
KMAX	=	1
LBUFA	=	1729
[illegible]	=	122
[illegible]D	=	0
[illegible]OD	=	2
NH	=	20
NHIC	=	1600
NM	=	3
NOP	=	0
NHIST	=	6
NPLPB	=	2
NPP	=	2
NROWPB	=	4
NSTN	=	0
NVARST	=	15
RAD	=	0
REZONE	=	0
STRESS	=	1
SURF	=	0
SW	=	6
SWX	=	0
VISC	=	0
LAMB	=	0
BBOUND	=	0
LBOUND	=	0
VOIDS	=	0
FLUXER	=	3
DEPOS	=	0
FAIL	=	0
STRAIN	=	1
WORK	=	0
MAT	=	3
AIR	=	1
CU	=	3
FE	=	2

+

+

THE FOLLOWING DEFINITIONS OR REDEFINITIONS WERE MADE DURING EXECUTIVE PROCESSING

```
+
+
SYS       =        176
VER       =          4
NOSBE     =          1
PF        =          1
ECS       =          1
OBJLIB    =          1
TAPELIB   =          4
ROUTE     =          1
DENSHUL   =          5
DENSLIB   =          5
DENSSTA   =          3
LABEL     =          1
DATE      =          1
CONTROL   =          1
CDC       =          1
IBM       =          0
CW        =         10
NW        =          1
RDEND     =          2
CARDL     =          8
CARDO     =         80
NHEC      =      11200
NBLKS     =          7
NPIC      =          0
NPICMAX   =       3020
STRAIN    =          1
STRESS    =          1
DEBUG     =          0
FILMPR    =          1
HLEV      =          1
D$NAMEA   =         21
D$NAMEB   =         12
D$NAMEB   =         13
D$NAMEC   =         14
D$NAMEC   =         15
D$NAMEC   =         16
D$NAMEC   =         18
D$NAMED   =          5
AIREOS    =          1
```

```
PLANK START
NOT A 555 RECORD
PROB    1.2000  STARTUP ON CYCLE     0  TIME    0.
+
+
+
+
+
+
                MATERIAL PROPERTIES DEFINED FOR THIS RUN
 MATERIAL    AMBIENT YIELD     THERMAL SHOFTENING          WORK HARDENING
                  (Y0)          YLD/Y0  EE/EMELT        YIELD    PLASTIC STRAIN
+
     2       4.690E+09       1.00E+00    0.              4.690E+09       0.
                             9.00E-01    5.00E-01        5.500E+09       3.00E-01
                             9.00E-01    5.00E-01
                             0.          1.00E+00
+
+
     3       8.000E+00       1.00E+00    0.              8.000E+08       0.
                             9.00E-01    5.00E-01        4.000E+09       3.00E-01
                             9.00E-01    5.00E-01
                             0.          1.00E+00
+
+
+
+
+
+
    CU PENETRATOR
+
+
+
+
ZSLK
    PROB            1.20000000000000E+00    17204631463146314632
    ATMOS           5.00000000000000E+00    17225000000000000000
    SREF            0.                      00000000000000000000
    CODE            1.00000000000000E+00    17204000000000000000
    COLD            0.                      77777777777777777776
    CYCLE           0.                      00000000000000000000
    DIMEN           2.00000000000000E+00    17214000000000000000
    DT              1.00000000000000E-00    16655274616704302142
    ELC             0.                      00000000000000000000
    EOS             6.00000000000000E+00    17226000000000000000
    ETH             0.                      00000000000000000000
    EXPAND          5.00000000000000E-02    17136314631463146315
    FAIL            0.                      00000000000000000000
    FLUXER          3.00000000000000E+00    17216000000000000000
    GEOM            2.00000000000000E+00    17214000000000000000
    IMAX            2.00000000000000E+01    17245000000000000000
    IQ              1.00000000000000E+01    17244600000000000004
    ISLAND          0.                      00000000000000000000
    JMAX            2.80000000000000E+01    17247000000000000000
```

JO	2.7000000000000000E+01	1724660000000000000
HOB	0.	0030000000000000000
LREF	0.	7777777777777777776
METHOD	2.0000000200000000E+00	1721400000200000000
MLC	0.	0000000000000000009
MTH	0.	0000000000000000000
NH	2.6000000000000000E+01	1724500000000000000
NHIC	1.6000000000000000E+03	1732620000000000000
NHIST	6.0000000000000000E+00	1722600000000000000
NM	3.0000000000000000E+00	1721600000000000000
NOP	0.	0000000000000000000
NPP	2.0000000000000000E+00	1721400000000000000
NROWPB	4.0000000000000000E+00	1722400000000000000
PTSTOP	6.0000000000000000E+02	1731454000000000009
PADLOS	0.	0000000000000000000
REZONE	0.	0000000000000000000
RREF	0.	0000000000000000000
STABF	5.0000000000000000E-01	1717400000000000000
STRAIN	1.0000000000000000E+00	1720400000000000000
STRESS	1.0000000000000000E+00	1720400000000000000
SUME	0.	0000000000000000000
T	0.	0000000000000000000
TERAD	0.	0000000000000000000
TLC	0.	0000000000000000000
TREF	0.	0000000000000000000
TTIME	0.	0000000000000000000
TTIME6	0.	0000000000000000000
TTIME7	0.	0000000000000000000
TTSTOP	1.0000000000000000E+02	1726620000000000000
UREZ	1.0000000000000000E+01	1723500000000000000
VISC	0.	0000000000000000000
VREZ	1.0000000000000000E+01	1723500000000000000
VOIDS	0.	0000000000000000000
WORK	0.	0000000000000000000
X1	4.0000000000000000E+00	1722400000000000000
X2	-1.0000000000000000E+00	6057377777777777777
XOB	0.	0000000000000000000
Y1	5.0000000000000000E+00	1722500000000000000
Y2	2.3000000000000000E+01	1724560000000000000
YGND	0.	0000000000000000000
YIELD	0.	0000000000000000000
AIR	1.0000000000000000E+00	1720400000000000000
CU	3.0000000000000000E+00	1721600000000000000
FE	2.0000000000000000E+00	1721400000000000000
	0.	0000000000000000000
	0.	0000000000000000000
	0.	0000000000000000000
	0.	0000000000000000000
	0.	0000000000000000000
	0.	0000000000000000000
	0.	0000000000000000000
	0.	0000000000000000000
	0.	0000000000000000000
	0.	0000000000000000000

```
                  0.                      00000000000000000000
                  0.                      00000000000000000000
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                  0.                      00000000000000000000
                  0.                      00000000000000000000
                  0.                      00000000000000000000
                  0.                      00000000000000000000
                  0.                      00000000000000000000
                  0.                      00000000000000000000
                  0.                      00000000000000000000
                  0.                      00000000000000000000
                  0.                      00000000000000000000
                  0.                      00000000000000000000
                  0.                      00000000000000000000
+
INOPT
    MRELER        1.00000000000000E+01    17235000000000000000
    CSTOP         1.18000000000000E+02    17267300000000000000
    RTSTOP        1.00000000000000E+20    20235327435361326142
    DCYCST        1.00000000000000E+20    20235327435361326142
    PRINTW        0.                      77777777777777777776
    DEBUG         0.                      00000000000000000000
    XINEW         1.50000000000000E+01    17237400000000000000
    YINEW         5.50000000000000E+01    17256700000000000000
    Y2NEW         8.50000000000000E+01    17265240000000000000
    TIMES         3.00000000000000E+00    17216000000000000000
    DMPINT        9.99999999999977E-07    16744143367501327551
    VMIN          1.00000000000000E-03    17064061115645706520
    ITRACE        0.                      00000000000000000000
    JTRACE        0.                      00000000000000000000
+
+
************
************
+
PROB    1.2000     CYCLE     0     TIME  0.              DT  1.000000E-08
+
+
+
   INTERNAL ENERGY        KINETIC ENERGY        TOTAL ENERGY              ETH                   REL ERROR
 8.34280739596090E+11  2.50739591033307E+13  2.59082398429268E+13  2.59082398429268E+13   0.
+
                                             TOTAL MASS                MTH                    RELMERR
                                           6.69458549226732E+02  6.69458549226732E+02   0.
+
MAX VEL =          -I AT I**** J****
+
MAX CS =           -I AT I**** J****
+
```
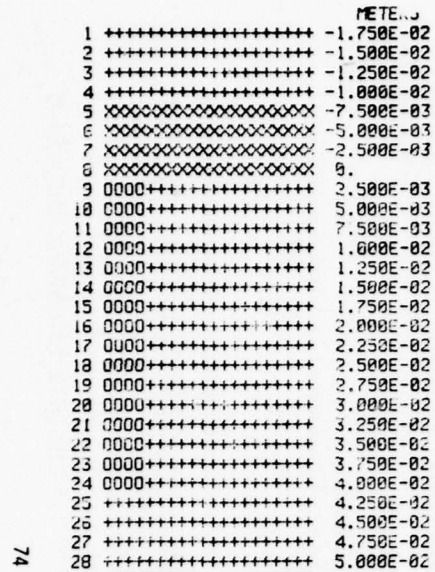

```
MAX TEMP=            -I AT I***** J*****
+
MAX P =              -I AT I***** J*****
+
CELL SETTING DT, I***** J*****
+
+
TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN,  0 SEC
                    OF THIS     0 HOURS,  0 MIN,  0 SEC IS 6600 TIME.
                        AND     0 HOURS,  0 MIN,  0 SEC IS 7600/176 TIME.
+
TIME FOR THIS RUN     0 HOURS,  0 MIN, 22 SEC
+
I=   1  X(I)=      .250   DX(I)=      .250
+
 J       P         U         V         XI        RHO       SRR       SZZ       SRZ       Y        DY     M      XM      M      XM
+
  1  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.75E+00 2.50E-01 1 6.01320E-05
  2  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.50E+00 2.50E-01 1 6.01320E-05
  3  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.25E+00 2.50E-01 1 6.01320E-05
  4  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.00E+00 2.50E-01 1 6.01320E-05
  5  1.013E+06  0.        3.00E+05 1.268E+09 7.860E+00  0.        0.        0.       -7.50E-01 2.50E-01 2 3.85827E-01
  6  1.013E+06  0.        3.00E+05 1.268E+09 7.860E+00  0.        0.        0.       -5.00E-01 2.50E-01 2 3.85827E-01
  7  1.013E+06  0.        3.00E+05 1.268E+09 7.860E+00  0.        0.        0.       -2.50E-01 2.50E-01 2 3.85827E-01
  8  1.013E+06  0.        3.00E+05 1.268E+09 7.860E+00  0.        0.        0.        0.       2.50E-01 2 3.85827E-01
  9  1.013E+06  0.        0.       1.133E+09 8.900E+00  0.        0.        0.        2.50E-01 2.50E-01 3 4.36878E-01
 10  1.013E+06  0.        0.       1.133E+09 8.900E+00  0.        0.        0.        5.00E-01 2.50E-01 3 4.36878E-01
 11  1.013E+06  0.        0.       1.133E+09 8.900E+00  0.        0.        0.        7.50E-01 2.50E-01 3 4.36878E-01
 12  1.013E+06  0.        0.       1.133E+09 8.900E+00  0.        0.        0.        1.00E+00 2.50E-01 3 4.36878E-01
 13  1.013E+06  0.        0.       1.133E+09 8.900E+00  0.        0.        0.        1.25E+00 2.50E-01 3 4.36878E-01
 14  1.013E+06  0.        0.       1.133E+09 8.900E+00  0.        0.        0.        1.50E+00 2.50E-01 3 4.36878E-01
 15  1.013E+06  0.        0.       1.133E+09 8.900E+00  0.        0.        0.        1.75E+00 2.50E-01 3 4.36878E-01
 16  1.013E+06  0.        0.       1.133E+09 8.900E+00  0.        0.        0.        2.00E+00 2.50E-01 3 4.36878E-01
 17  1.013E+06  0.        0.       1.133E+09 8.900E+00  0.        0.        0.        2.25E+00 2.50E-01 3 4.36878E-01
 18  1.013E+06  0.        0.       1.133E+09 8.900E+00  0.        0.        0.        2.50E+00 2.50E-01 3 4.36878E-01
 19  1.013E+06  0.        0.       1.133E+09 8.900E+00  0.        0.        0.        2.75E+00 2.50E-01 3 4.36878E-01
 20  1.013E+06  0.        0.       1.133E+09 8.900E+00  0.        0.        0.        3.00E+00 2.50E-01 3 4.36878E-01
 21  1.013E+06  0.        0.       1.133E+09 8.900E+00  0.        0.        0.        3.25E+00 2.50E-01 3 4.36878E-01
 22  1.013E+06  0.        0.       1.133E+09 8.900E+00  0.        0.        0.        3.50E+00 2.50E-01 3 4.36878E-01
 23  1.013E+06  0.        0.       1.133E+09 8.900E+00  0.        0.        0.        3.75E+00 2.50E-01 3 4.36878E-01
 24  1.013E+06  0.        0.       1.133E+09 8.900E+00  0.        0.        0.        4.00E+00 2.50E-01 3 4.36878E-01
 25  1.013E+06  0.        0.       2.044E+09 1.225E-03  0.        0.        0.        4.25E+00 2.50E-01 1 6.01320E-05
 26  1.013E+06  0.        0.       2.044E+09 1.225E-03  0.        0.        0.        4.50E+00 2.50E-01 1 6.01320E-05
 27  1.013E+06  0.        0.       2.044E+09 1.225E-03  0.        0.        0.        4.75E+00 2.50E-01 1 6.01320E-05
 28  1.013E+06  0.        0.       2.044E+09 1.225E-03  0.        0.        0.        5.00E+00 2.50E-01 1 6.01320E-05
+
                                                                    MATERIAL MAP
+
+
            1         2

                                ALTITUDE
    12345678901234567890
```



CYCLE 1 TIME 1.0000E-08 DT 3.285E-08 IDT 7 JDT 5
CYCLE 2 TIME 4.2854E-08 DT 4.886E-08 IDT 4 JDT 8
CYCLE 3 TIME 9.1712E-08 DT 6.338E-08 IDT 1 JDT 8
CYCLE 4 TIME 1.5509E-07 DT 7.646E-08 IDT 1 JDT 8
CYCLE 5 TIME 2.3155E-07 DT 8.836E-08 IDT 1 JDT 8
CYCLE 6 TIME 3.1991E-07 DT 9.969E-08 IDT 1 JDT 8
CYCLE 7 TIME 4.1960E-07 DT 1.111E-07 IDT 1 JDT 8
CYCLE 8 TIME 5.3072E-07 DT 1.233E-07 IDT 1 JDT 8
CYCLE 9 TIME 6.5407E-07 DT 1.370E-07 IDT 1 JDT 8
CYCLE 10 TIME 7.9102E-07 DT 1.149E-07 IDT 1 JDT 8
CYCLE 11 TIME 9.0596E-07 DT 9.404E-08 IDT 1 JDT 8
CYCLE 12 TIME 1.0000E-06 DT 1.415E-07 IDT 1 JDT 8

+
+
****
****
+
PROB 1.2000 CYCLE 12 TIME 1.000000E-06 DT 1.415109E-07
+
+
+

INTERNAL ENERGY	KINETIC ENERGY	TOTAL ENERGY	ETH	REL ERROR
1.1939577122475SE+12	2.471551011722 10E+13	2.590946782946 85E+13	2.5999486871490E+13	-7.32460686745991E-01

```
+
                                                    TOTAL MASS                MTH                  RELMERR
                                                 6.6948459959184E+02    6.6948459959180E+02    5.43399924256650E-00
+
MAX VEL =  3.03104E+05 AT I   6 J   9
+
MAX CS =   7.28635E+05 AT I   1 J   8
+
MAX TEMP=  3.34345E+03 AT I   5 J  10
+
MAX P =   1.09846E+12 AT I   1 J   9
+
CELL SETTING DT, I   1 J   8
+
+
TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN,  3 SEC
                  OF THIS       0 HOURS,  0 MIN,  0 SEC IS 6600 TIME.
                     AND        0 HOURS,  0 MIN,  3 SEC IS 7600/176 TIME.
+
TIME FOR THIS RUN     0 HOURS,  0 MIN, 25 SEC
+
WHIZ FACTOR TOTAL PROBLEM   = 4.93E-04 SEC/CELL/CYCLE
+
WHIZ FACTOR SINCE LAST DUMP = 5.12E-04 SEC/CELL/CYCLE
+
+
+
+
I=   1  X(I)=      .250   DX(I)=      .250
+
 J       P         U         V         XI        RHO       SRR       SZZ       SRZ       Y        DY    M      XM     M      XM
+
  1  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.75E+00 2.50E-01 1 6.01320E-05
  2  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.50E+00 2.50E-01 1 6.01321E-05
  3  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.25E+00 2.50E-01 1 6.01321E-05
  4  1.020E+06  0.        3.00E+05 2.047E+09 1.232E-03  0.        0.        0.       -1.00E+00 2.50E-01 1 6.04633E-05
  5  1.042E+06  1.78E+00  2.95E+05 2.074E+09 1.243E-03  0.        0.        0.       -7.50E-01 2.50E-01 1 6.09913E-05
  6  1.542E+06  6.61E+01  2.80E+05 1.683E+09 6.858E+00  1.66E+09 -3.10E+09  0.       -5.00E-01 2.50E-01 1 1.08349E-05 2 3.36617E-01
  7  2.591E+11  6.77E+02  2.22E+05 4.789E+09 8.690E+00  1.75E+09 -2.95E+09  2.42E+07 -2.50E-01 2.50E-01 2 4.26568E-01
  8  7.419E+11  1.52E+03  1.59E+05 1.379E+10 9.677E+00  8.83E+08 -2.05E+09  3.40E+07  0.        2.50E-01 2 4.74996E-01
  9  1.058E+12  2.66E+03  1.60E+05 1.808E+10 1.099E+01  0.        0.        0.        2.50E-01 2.50E-01 2 2.91542E-01 3 2.47747E-01
 10  6.619E+11  9.19E+02  1.41E+05 1.308E+10 1.103E+01  3.45E+07 -6.71E+07 -1.02E+06  5.00E-01 2.50E-01 3 5.41224E-01
 11  2.779E+11  1.65E+02  5.25E+04 4.563E+09 1.009E+01  2.63E+08 -4.87E+08 -2.37E+06  7.50E-01 2.50E-01 3 4.95209E-01
 12  4.515E+10  8.75E+01  1.17E+04 1.348E+09 9.157E+00  3.25E+08 -5.24E+08 -1.06E+06  1.00E+00 2.50E-01 3 4.49471E-01
 13  7.281E+09  2.27E+01  1.40E+03 1.138E+09 8.946E+00  3.20E+08 -5.29E+08 -5.11E+06  1.25E+00 2.50E-01 3 4.39130E-01
 14  7.412E+08  4.51E+00  2.07E+02 1.133E+09 8.905E+00  9.00E+07 -1.24E+08 -1.50E+06  1.50E+00 2.50E-01 3 4.37110E-01
 15  1.052E+08  2.48E-01  1.73E+01 1.133E+09 8.901E+00  1.05E+07 -1.70E+07 -2.23E+05  1.75E+00 2.50E-01 3 4.36910E-01
 16  8.672E+06  3.11E-02  2.02E+00 1.133E+09 8.900E+00  7.57E+05 -9.49E+05 -8.71E+03  2.00E+00 2.50E-01 3 4.36880E-01
 17  1.861E+06  1.24E-08  1.15E-01 1.133E+09 8.900E+00  6.66E+04 -1.05E+05 -9.15E+02  2.25E+00 2.50E-01 3 4.36878E-01
 18  1.057E+06  0.        1.02E-02 1.133E+09 8.900E+00  3.31E+03 -3.67E+03  2.04E-01  2.50E+00 2.50E-01 3 4.36878E-01
 19  1.016E+06  0.        1.95E-11 1.133E+09 8.900E+00  1.64E+02 -2.39E+02  6.19E-10  2.75E+00 2.50E-01 3 4.36878E-01
 20  1.013E+06  0.        0.       1.133E+09 8.900E+00  0.       -2.25E-07  0.        3.00E+00 2.50E-01 3 4.36879E-01
 21  1.013E+06  0.        0.       1.133E+09 8.900E+00  0.        0.        0         3.25E+00 2.50E-01 3 4.36878E-01
 22  1.013E+06  0.        0.       1.133E+09 8.900E+00  0.        0.                  3.[illegible] 2.50E-01 3 4.36878E-01
```

23	1.013E+06	0.	0.	1.133E+09	8.900E+00	0.	0.	0.	3.75E+00	2.50E-01	3	4.36878E-0
24	1.013E+06	0.	0.	1.133E+09	8.900E+00	0.	0.	0.	4.00E+00	2.50E-01	3	4.36878E-01
25	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	4.25E+00	2.50E-01	1	6.01320E-05
26	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	4.50E+00	2.50E-01	1	6.01320E-05
27	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	4.75E+00	2.50E-01	1	6.01320E-05
28	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	5.00E+00	2.50E-01	1	6.01320E-0

+

ENERGY MAP

+

+

1 2

ALTITUDE

12345678901234567890

METERS

```
 1                     -1.750E-02
 2                     -1.500E-02
 3                     -1.250E-02
 4                     -1.000E-02
 5          TTTTTTTTTTTT -7.500E-03
 6 TTTTTTT              -5.000E-03
 7 BBBBBBB              -2.500E-03
 8          BBBBBBBBBBBB 0.
 9                      2.500E-03
10 TTTT T               5.000E-03
11     B                7.500E-03
12     TTTTTTTTTTTTTTTT 1.000E-02
13     B                1.250E-02
14                      1.500E-02
15                      1.750E-02
16                      2.000E-02
17                      2.250E-02
18                      2.500E-02
19                      2.750E-02
20                      3.000E-02
21                      3.250E-02
22                      3.500E-02
23                      3.750E-02
24                      4.000E-02
25 BBBB                 4.250E-02
26                      4.500E-02
27                      4.750E-02
28      BBBBBBBBBBBBBBBB 5.000E-02
12345678901234567890
          1         2
```

+

MATERIAL MAP

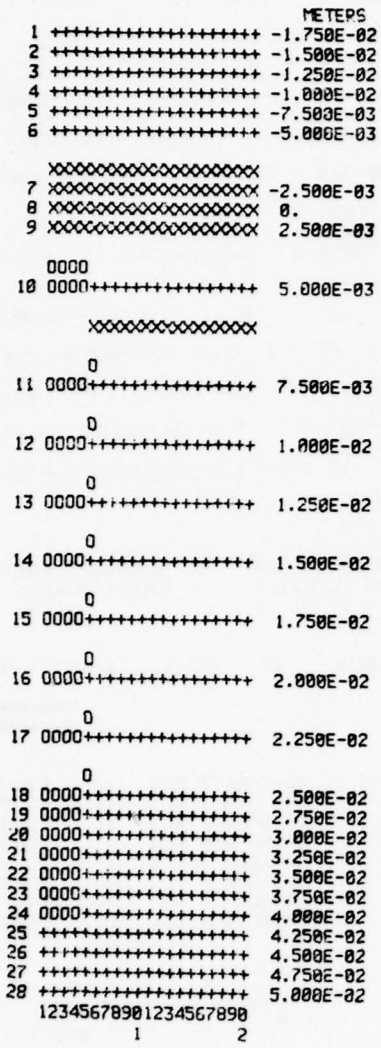
+

+

1 2

ALTITUDE

12345678901234567890


METERS
1 -1.750E-02
2 -1.500E-02
3 -1.250E-02
4 -1.000E-02
5 -7.500E-03
6 -5.000E-03
7 -2.500E-03
8 0.
9 2.500E-03
10 5.000E-03
11 7.500E-03
12 1.000E-02
13 1.250E-02
14 1.500E-02
15 1.750E-02
16 2.000E-02
17 2.250E-02
18 2.500E-02
19 2.750E-02
20 3.000E-02
21 3.250E-02
22 3.500E-02
23 3.750E-02
24 4.000E-02
25 4.250E-02
26 4.500E-02
27 4.750E-02
28 5.000E-02
12345678901234567890
1 2

```
   CYCLE    13   TIME 1.1415E-06  DT 1.444E-07   IDT    1  JDT    8
   CYCLE    14   TIME 1.2859E-06  DT 1.435E-07   IDT    5  JDT    9
   CYCLE    15   TIME 1.4294E-06  DT 1.413E-07   IDT    5  JDT    9
   CYCLE    16   TIME 1.5707E-06  DT 1.412E-07   IDT    5  JDT    9
   CYCLE    17   TIME 1.7119E-06  DT 1.419E-07   IDT    6  JDT    9
   CYCLE    18   TIME 1.8538E-06  DT 8.043E-08   IDT    6  JDT    9
   CYCLE    19   TIME 1.9342E-06  DT 6.580E-08   IDT    6  JDT   10
   CYCLE    20   TIME 2.0000E-06  DT 1.421E-07   IDT    6  JDT   10
+
+
**********
**********
+
PROB    1.2000     CYCLE    20     TIME  2.000000E-06     DT  1.420614E-07
+
+
+
     INTERNAL ENERGY          KINETIC ENERGY          TOTAL ENERGY              ETH                  REL ERROR
   1.30082647427226E+12    2.46116495369098E+13    2.59124760111820E+13    2.59107333588040E+13    6.79884789198791E+01
+
                                                      TOTAL MASS              MTH                  RELMERR
                                                   6.69510663282919E+02    6.69510663282843E+02    5.97716646987911E-08
+
MAX VEL =  3.34799E+05 AT I   6 J  11
+
MAX CS =   5.89024E+05 AT I   1 J   7
+
MAX TEMP=   4.51326E+03 AT I   5 J  11
+
MAX P =   5.42096E+11 AT I   1 J  12
+
CELL SETTING DT, I   6 J  10
+
+
TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN,  5 SEC
                  OF THIS       0 HOURS,  0 MIN,  0 SEC IS 6600 TIME.
                     AND        0 HOURS,  0 MIN,  5 SEC IS 7600/176 TIME.
+
TIME FOR THIS RUN     0 HOURS,  0 MIN, 27 SEC
+
WHIZ FACTOR TOTAL PROBLEM   = 5.27E-04 SEC/CELL/CYCLE
+
WHIZ FACTOR SINCE LAST DUMP = 5.73E-04 SEC/CELL/CYCLE
+
+
+
+
I=   1  X(I)=      .250   DX(I)=      .250
+
 J       P        U         V         XI        RHO       SRR       SZZ       SRZ        Y        DY    M      XM     M      XM
+
  1  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.75E+00 2.50E-01 1 6.01320E-05
  2  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.50E+00 2.50E-01 1 6.01325E-05
  3  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.25E+00 2.50E-01 1 6.01373E-05
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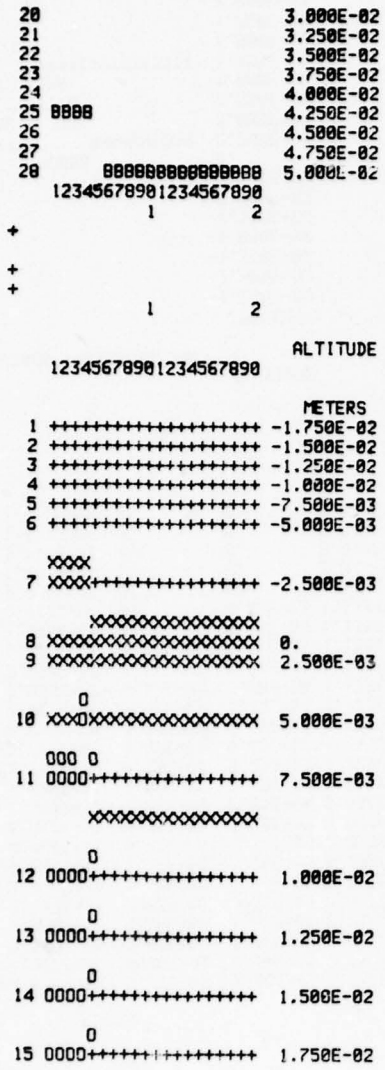
4	1.819E+06	5.87E-03	3.00E+05	2.047E+09	1.231E-03	0.	0.	0.	-1.00E+00	2.50E-01	1	6.04074E-05	
5	1.335E+06	8.46E-01	2.98E+05	2.201E+09	1.503E-03	0.	0.	0.	-7.50E-01	2.50E-01	1	7.37571E-05	
6	3.660E+06	3.07E+02	1.72E+05	7.471E+09	1.612E+00	1.24E+09	-2.32E+09	0.	-5.00E-01	2.50E-01	1	7.01759E-05	2 7.90500E-02
7	2.485E+11	3.38E+03	1.06E+05	7.231E+09	8.532E+00	6.89E+08	-2.67E+09	5.96E+08	-2.50E-01	2.50E-01	2	4.18827E-01	
8	2.152E+11	7.73E+03	1.32E+05	7.637E+09	8.392E+00	8.59E+08	-2.49E+09	1.09E+09	0.	2.50E-01	2	4.11947E-01	
9	1.368E+11	1.19E+04	1.34E+05	5.575E+09	8.201E+00	1.79E+09	-2.84E+09	3.69E+08	2.50E-01	2.50E-01	2	4.02588E-01	
10	2.668E+11	1.27E+04	1.28E+05	9.332E+09	9.379E+00	0.	0.	0.	5.00E-01	2.50E-01	2	6.20146E-02	3 3.98383E-01
11	4.768E+11	9.73E+03	1.36E+05	1.029E+10	1.047E+01	5.30E+07	-1.23E+08	-1.60E+07	7.50E-01	2.50E-01	3	5.13997E-01	
12	5.417E+11	4.91E+03	1.25E+05	9.097E+09	1.088E+01	1.28E+08	-2.84E+08	-2.55E+07	1.00E+00	2.50E-01	3	5.34136E-01	
13	3.375E+11	1.53E+03	7.25E+04	5.036E+09	1.033E+01	2.41E+08	-4.85E+08	-2.31E+07	1.25E+00	2.50E-01	3	5.07242E-01	
14	1.026E+11	3.05E+02	2.48E+04	1.809E+09	9.443E+00	2.83E+08	-5.20E+08	-1.23E+07	1.50E+00	2.50E-01	3	4.63516E-01	
15	2.185E+10	8.23E+01	5.22E+03	1.173E+09	9.033E+00	3.00E+08	-5.31E+08	-6.12F+06	1.75E+00	2.50E-01	3	4.43426E-01	
16	3.722E+09	3.49E+01	9.86E+02	1.135E+09	8.924E+00	3.31E+08	-5.28E+08	-9.27E+06	2.00E+00	2.50E-01	3	4.38037E-01	
17	6.713E+08	4.84E+00	1.66E+02	1.133E+09	8.904E+00	9.57E+07	-1.59E+08	-3.82E+06	2.25E+00	2.50E-01	3	4.37088E-01	
18	1.021E+08	8.27E-01	2.76E+01	1.133E+09	8.901E+00	1.40E+07	-2.19E+07	-4.25E+05	2.50E+00	2.50E-01	3	4.36909E-01	
19	1.693E+07	8.43E-02	3.60E+00	1.133E+09	8.900E+00	2.04E+06	-3.36E+06	-6.52E+04	2.75E+00	2.50E-01	3	4.36883E-01	
20	2.894E+06	1.13E-02	5.06E-01	1.133E+09	8.900E+00	2.38E+05	-3.63E+05	-5.57E+03	3.00E+00	2.50E-01	3	4.36878E-01	
21	1.263E+06	8.33E-10	5.17E-02	1.133E+09	8.900E+00	2.87E+04	-4.66E+04	-4.99E+02	3.25E+00	2.50E-01	3	4.36878E-01	
22	1.036E+06	0.	5.75E-03	1.133E+09	8.900E+00	2.51E+03	-3.56E+03	2.07E+00	3.50E+00	2.50E-01	3	4.36878E-01	
23	1.015E+06	0.	4.35E-12	1.133E+09	8.900E+00	1.28E+02	-3.63E+02	3.61E-09	3.75E+00	2.50E-01	3	4.36878E-01	
24	1.013E+06	0.	0.	1.133E+09	8.900E+00	0.	-2.07E-07	0.	4.00E+00	2.50E-01	3	4.36878E-01	
25	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	4.25E+00	2.50E-01	1	6.01320E-05	
26	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	4.50E+00	2.50E-01	1	6.01320E-05	
27	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	4.75E+00	2.50E-01	1	6.01320E-05	
28	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	5.00E+00	2.50E-01	1	6.01320E-05	

ENERGY MAP


```
                1         2

                                  ALTITUDE
    12345678901234567890

                                    METERS
 1                                -1.750E-02
 2                                -1.500E-02
 3                                -1.250E-02
 4                                -1.000E-02
 5                                -7.500E-03
 6                                -5.000E-03
 7 TT   TTTTTTTTTTTTTTT           -2.500E-03
 8 BB   BBBBB                      0.
 9 TTT        BBBBBBBBBB           2.500E-03
10 BBB    TT                      5.000E-03
11   TT TT B                      7.500E-03
12 TT  TBBB                       1.000E-02
13      TTTTTTTTTTTTTTT           1.250E-02
14                                1.500E-02
15                                1.750E-02
16     B                          2.000E-02
17                                2.250E-02
18                                2.500E-02
19                                2.750E-02
```



MATERIAL MAP

```
        0
16 0000++++++++++++++++  2.000E-02

        0
17 0000++++++++++++++++  2.250E-02

        0
18 0000++++++++++++++++  2.500E-02

        0
19 0000++++++++++++++++  2.750E-02

        0
20 0000++++++++++++++++  3.000E-02

        0
21 0000++++++++++++++++  3.250E-02

        0
22 0000++++++++++++++++  3.500E-02
23 0000++++++++++++++++  3.750E-02
24 0000++++++++++++++++  4.000E-02
25 ++++++++++++++++++++  4.250E-02
26 ++++++++++++++++++++  4.500E-02
27 ++++++++++++++++++++  4.750E-02
28 ++++++++++++++++++++  5.000E-02
   12345678901234567890
             1         2
  CYCLE    21   TIME 2.1421E-06  DT 1.409E-07   IDT    6  JDT   10
  CYCLE    22   TIME 2.2829E-06  DT 1.416E-07   IDT    6  JDT   10
  CYCLE    23   TIME 2.4245E-06  DT 1.443E-07   IDT    6  JDT   10
  CYCLE    24   TIME 2.5688E-06  DT 1.482E-07   IDT    7  JDT   10
  CYCLE    25   TIME 2.7170E-06  DT 1.556E-07   IDT    7  JDT   10
IN EOS, J =  10 FORMING DPDTAU
IN EOS, J =  11 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
  CYCLE    26   TIME 2.8727E-06  DT 1.273E-07   IDT    7  JDT   11
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  10 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J =  11 FORMING DPDTAU
  CYCLE    27   TIME 3.0000E-06  DT 1.483E-07   IDT    7  JDT   11
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  11 FORMING DPDTAU
+
+
**********
**********
+
PROB    1.2000     CYCLE    27     TIME  3.000000E-06     DT  1.483434E-07
```

```
+
+
+
     INTERNAL ENERGY          KINETIC ENERGY          TOTAL ENERGY              ETH                REL ERROR
   1.37552587704973E+12    2.45400257451570E+13    2.59155516230066E+13    2.59119793636657E+13    7.06037890559410E+01
+
                                                      TOTAL MASS              MTH                RELMERR
                                                   6.69536779123177E+02    6.69536779123067E+02    4.89021917542369E-08
+
MAX VEL =  3.40481E+05 AT I   6 J  13
+
MAX CS =   5.14419E+05 AT I   7 J  11
+
MAX TEMP=  7.52860E+03 AT I   5 J  11
+
MAX P =   3.08783E+11 AT I   1 J  14
+
CELL SETTING DT, I   7 J  11
+
+
TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN,  8 SEC
                  OF THIS       0 HOURS,  0 MIN,  0 SEC IS 6600 TIME.
                     AND        0 HOURS,  0 MIN,  8 SEC IS 7600/176 TIME.
+
TIME FOR THIS RUN     0 HOURS,  0 MIN, 30 SEC
+
WHIZ FACTOR TOTAL PROBLEM   = 5.48E-04 SEC/CELL/CYCLE
+
WHIZ FACTOR SINCE LAST DUMP = 6.21E-04 SEC/CELL/CYCLE
+
+
+
+
I=   1  X(I)=      .250   DX(I)=      .250
+
 J       P          U          V          XI         RHO        SRR        SZZ        SRZ         Y        DY    M      XM1     M      XM1
+
  1  1.013E+06  0.         3.00E+05 2.044E+09 1.225E-03  0.         0.         0.        -1.75E+00 2.50E-01 1 6.01320E-05
  2  1.013E+06  0.         3.00E+05 2.044E+09 1.225E-03  0.         0.         0.        -1.50E+00 2.50E-01 1 6.01326E-05
  3  1.014E+06  1.87E-03   3.00E+05 2.044E+09 1.226E-03  0.         0.         0.        -1.25E+00 2.50E-01 1 6.01604E-05
  4  1.019E+06  2.39E-02   3.00E+05 2.047E+09 1.230E-03  0.         0.         0.        -1.00E+00 2.50E-01 1 6.03877E-05
  5  1.692E+06  9.63E+00   2.97E+05 2.475E+09 1.699E-03  0.         0.         0.        -7.50E-01 2.50E-01 1 8.34219E-05
  6  6.981E+06  3.75E+02   1.87E+05 8.089E+09 2.307E-03  0.         0.         0.        -5.00E-01 2.50E-01 1 1.13255E-04
  7  4.636E+06  2.45E+03   9.97E+04 6.638E+09 5.838E+00 -2.24E+09 -2.70E+08  0.        -2.50E-01 2.50E-01 1 1.06057E-05 2 2.86543E-01
  8 -1.099E+11  6.58E+03   1.20E+05 7.060E+09 6.991E+00  1.11E+09  8.40E+08  1.38E+09  0.        2.50E-01 2 3.43146E-01
  9 -9.619E+10  7.52E+03   1.21E+05 6.234E+09 7.177E+00  1.69E+09 -2.79E+09  3.10E+08  2.50E-01 2.50E-01 2 3.52288E-01
IN EOS, HIT NTRY LIMIT
 10  1.063E+06  1.20E+04   1.02E+05 6.476E+09 7.351E+00  0.         0.         0.        5.00E-01 2.50E-01 3 1.53936E-01 2 2.86902E-01
 11  0.         1.04E+04   8.73E+04 6.702E+09 7.963E+00  0.         0.         0.        7.50E-01 2.50E-01 3 3.90904E-01
 12  1.868E+10  1.22E+04   8.20E+04 5.250E+09 8.579E+00  8.15E+07 -1.42E+08 -6.02E+06  1.00E+00 2.50E-01 3 4.21116E-01
 13  1.637E+11  9.53E+03   8.86E+04 4.790E+09 9.469E+00  1.92E+08 -4.26E+08 -5.58E+07  1.25E+00 2.50E-01 3 4.64826E-01
 14  2.793E+11  5.69E+03   8.73E+04 4.722E+09 1.008E+01  2.00E+08 -4.80E+08 -4.85E+07  1.50E+00 2.50E-01 3 4.94751E-01
 15  2.378E+11  2.34E+03   6.11E+04 3.390E+09 1.000E+01  2.36E+08 -5.00E+08 -3.35E+07  1.75E+00 2.50E-01 3 4.91098E-01
 16  1.071E+11  6.25E+02   2.72E+04 1.753E+09 9.475E+00  2.85E+08 -5.21E+08 -2.17E+07  2.00E+00 2.50E-01 3 4.65081E-01
```

```
17  3.156E+10  1.60E+02  7.88E+03 1.200E+09 9.090E+00  3.13E+08 -5.29E+08 -1.[illegible]E+07  2.25E+00 2.50E-01 3 4.46219E-01
18  7.335E+09  6.55E+01  1.86E+03 1.137E+09 8.946E+00  3.32E+08 -5.27E+08 -1.14E+07  2.50E+00 2.50E-01 3 4.39150E-01
19  1.630E+09  1.63E+01  4.14E+02 1.134E+09 8.910E+00  2.51E+08 -3.99E+08 -1.17E+07  2.75E+00 2.50E-01 3 4.37388E-01
20  3.432E+08  3.39E+00  8.96E+01 1.133E+09 8.902E+00  5.03E+07 -7.76E+07 -1.94E+06  3.00E+00 2.50E-01 3 4.36985E-01
21  7.085E+07  5.31E-01  1.65E+01 1.133E+09 8.900E+00  9.50E+06 -1.48E+07 -3.40E+05  3.25E+00 2.50E-01 3 4.36900E-01
22  1.310E+07  9.26E-02  2.97E+00 1.133E+09 8.900E+00  1.58E+06 -2.32E+06 -4.56E+04  3.50E+00 2.50E-01 3 4.36882E-01
23  3.094E+06  1.18E-02  4.54E-01 1.133E+09 8.900E+00  2.51E+05 -3.79E+05 -6.94E+03  3.75E+00 2.50E-01 3 4.36876E-01
24  1.270E+06  1.22E-03  7.02E-02 1.133E+09 8.900E+00  3.11E+04 -4.99E+04 -5.94E+02  4.00E+00 2.50E-01 3 4.36878E-01
25  1.013E+06  3.52E-07  1.17E-02 2.044E+09 1.226E-03  1.15E+01 -1.49E+01  0.         4.25E+00 2.50E-01 1 6.01320E-05 3 3.13420E-38
26  1.013E+06  0.        3.47E-11 2.044E+09 1.225E-03  0.        0.        0.         4.50E+00 2.50E-01 1 6.01320E-05
27  1.013E+06  0.        0.       2.044E+09 1.225E-03  0.        0.        0.         4.75E+00 2.50E-01 1 6.01320E-05
28  1.013E+06  0.        0.       2.044E+09 1.225E-03  0.        0.        0.         5.00E+00 2.50E-01 1 6.01320E-05
+
```

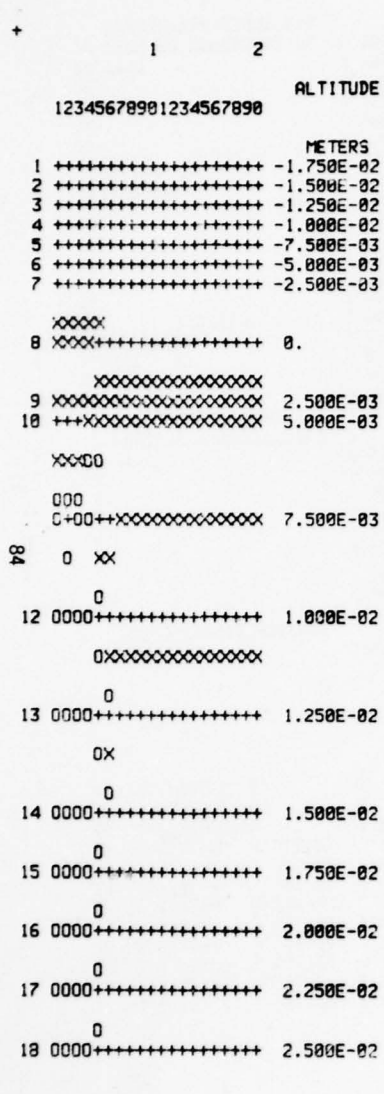
ENERGY MAP

```
+
+
            1         2

                                ALTITUDE
    12345678901234567890

                                  METERS
 1                               -1.750E-02
 2                               -1.500E-02
 3                               -1.250E-02
 4                               -1.000E-02
 5                               -7.500E-03
 6                               -5.000E-03
 7 TTTT                          -2.500E-03
 8 BBBBTTTTTTTTTTTTTTTT          0.
 9 TT  BBBBBBBBBBBBBBBB          2.500E-03
10 BB                            5.000E-03
11    T    TT                    7.500E-03
12 TTT   TT                      1.000E-02
13     T BBBB                    1.250E-02
14       TTTTTTTTTTTTTT          1.500E-02
15      T                        1.750E-02
16                               2.000E-02
17                               2.250E-02
18     B                         2.500E-02
19                               2.750E-02
20                    B          3.000E-02
21        B                      3.250E-02
22                               3.500E-02
23                               3.750E-02
24                               4.000E-02
25 BBBB                          4.250E-02
26                               4.500E-02
27 TTTT                          4.750E-02
28 BBBB BB BBBBBBBB BB           5.000E-02
    12345678901234567890
            1         2
+
```

MATERIAL MAP




```
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  11 FORMING DPDTAU
  CYCLE    28   TIME 3.1483E-06  DT 1.493E-07   IDT    7  JDT   11
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  10 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  11 FORMING DPDTAU
  CYCLE    29   TIME 3.2976E-06  DT 1.519E-07   IDT    7  JDT   11
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  10 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  11 FORMING DPDTAU
IN EOS, J =  11 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
  CYCLE    30   TIME 3.4495E-06  DT 1.518E-07   IDT    7  JDT   12
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
```

```
IN EOS, J =  10 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  10 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  10 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  11 FORMING DPDTAU
   CYCLE    31   TIME 3.6013E-06  DT 1.517E-07   IDT    7  JDT   12
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  10 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  11 FORMING DPDTAU
IN EOS, J =  11 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
   CYCLE    32   TIME 3.7530E-06  DT 1.359E-07   IDT    7  JDT   12
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  10 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  11 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J =  11 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
   CYCLE    33   TIME 3.8888E-06  DT 1.112E-07   IDT    8  JDT   12
IN EOS, HIT NTRY LIMIT
IN EOS, J =  10 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J =  11 FORMING DPDTAU
   CYCLE    34   TIME 4.0000E-06  DT 1.564E-07   IDT    8  JDT   12
IN EOS, J =  11 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  11 FORMING DPDTAU
+
+
**********
**********
+
PROB    1.2000     CYCLE    34     TIME  4.000000E-06     DT  1.563792E-07
+
+
+
     INTERNAL ENERGY          KINETIC ENERGY          TOTAL ENERGY              ETH                 REL ERROR
```

```
   1.46875933574765E+12    2.44480774644511E+13    2.59168368001988E+13    2.59132226943497E+13    1.61464826957865E+00
+
                                                        TOTAL MASS                  MTH                     RELMERR
                                                    6.69562871840641E+02    6.69562871840466E+02    9.78005520940008E-08
+
MAX VEL =  3.43426E+05 AT I   7 J  14
+
MAX CS =   5.17079E+05 AT I   1 J   8
+
MAX TEMP=   7.86224E+03 AT I   7 J  13
+
MAX P =   1.68777E+11 AT I   2 J  16
+
CELL SETTING DT, I   8 J  12
+
+
TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN, 11 SEC
                  OF THIS       0 HOURS,  0 MIN,  0 SEC IS 6600 TIME.
                      AND       0 HOURS,  0 MIN, 11 SEC IS 7600/176 TIME.
+
TIME FOR THIS RUN     0 HOURS,  0 MIN, 33 SEC
+
WHIZ FACTOR TOTAL PROBLEM   = 5.82E-04 SEC/CELL/CYCLE
+
WHIZ FACTOR SINCE LAST DUMP = 7.16E-04 SEC/CELL/CYCLE
+
+
+
+
I=   1  X(I)=      .250   DX(I)=     .250
+
 J       P        U         V        XI        RHO       SRR       SZZ       SRZ        Y        DY    M      XM     M      XM
+
  1  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.75E+00 2.50E-01 1 6.01320E-05
  2  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.50E+00 2.50E-01 1 6.01320E-05
  3  1.014E+06  1.56E-02  3.00E+05 2.045E+09 1.226E-03  0.        0.        0.       -1.25E+00 2.50E-01 1 6.01819E-05
  4  1.025E+06  2.26E-01  2.99E+05 2.051E+09 1.235E-03  0.        0.        0.       -1.00E+00 2.50E-01 1 6.06242E-05
  5  1.542E+06  2.14E+01  2.94E+05 2.507E+09 1.529E-03  0.        0.        0.       -7.50E-01 2.50E-01 1 7.50708E-05
  6  7.713E+06  3.77E+02  2.36E+05 7.899E+09 2.604E-03  0.        0.        0.       -5.00E-01 2.50E-01 1 1.27835E-04
  7  6.306E+06 -2.17E+03  1.39E+05 7.181E+09 1.450E+00 -2.00E+09 -2.41E+08  0.       -2.50E-01 2.50E-01 1 7.91554E-05 2 7.11206E-02
  8 -8.397E+10  5.53E+03  1.49E+05 7.967E+09 6.931E+00  1.17E+09 -2.02E+09  1.64E+08  0.        2.50E-01 2 3.40246E-01
  9 -7.624E+10  7.16E+03  1.12E+05 7.649E+09 7.048E+00  1.21E+09 -2.20E+09  7.54E+07  2.50E-01 2.50E-01 2 3.45962E-01
 10  2.779E+05  1.02E+04  8.33E+04 5.929E+09 5.948E+00  4.86E+08 -8.86E+08  0.        5.00E-01 2.50E-01 1 3.65953E-06 2 2.91970E-01
IN EOS, J =  28 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
 11  9.918E+03  4.80E+03  8.53E+04 7.143E+09 6.913E+00  0.        0.        0.        7.50E-01 2.50E-01 3 3.31642E-01 2 7.70114E-03
 12  0.         1.24E+04  7.70E+04 6.350E+09 6.976E+00  0.        0.        0.        1.00E+00 2.50E-01 3 3.42452E-01
 13  0.         1.25E+04  6.40E+04 4.825E+09 7.603E+00  9.29E+07 -1.89E+08 -1.20E+07  1.25E+00 2.50E-01 3 3.73225E-01
 14 -3.042E+10  8.59E+03  5.29E+04 3.439E+09 8.375E+00  2.84E+08 -4.71E+08 -5.89E+07  1.50E+00 2.50E-01 3 4.11104E-01
 15  5.586E+10  6.10E+03  5.26E+04 2.662E+09 9.076E+00  2.44E+08 -4.99E+08 -5.25E+07  1.75E+00 2.50E-01 3 4.45540E-01
 16  1.360E+11  3.72E+03  5.34E+04 2.466E+09 9.560E+00  2.23E+08 -5.07E+08 -4.27E+07  2.00E+00 2.50E-01 3 4.69288E-01
 17  1.354E+11  1.73E+03  4.84E+04 2.023E+09 9.604E+00  2.43E+08 -5.17E+08 -3.20E+07  2.25E+00 2.50E-01 3 4.71411E-01
 18  7.513E+10  5.89E+02  2.08E+04 1.438E+09 9.325E+00  2.74E+08 -5.27E+08 -2.32E+07  2.50E+00 2.50E-01 3 4.57728E-01
```

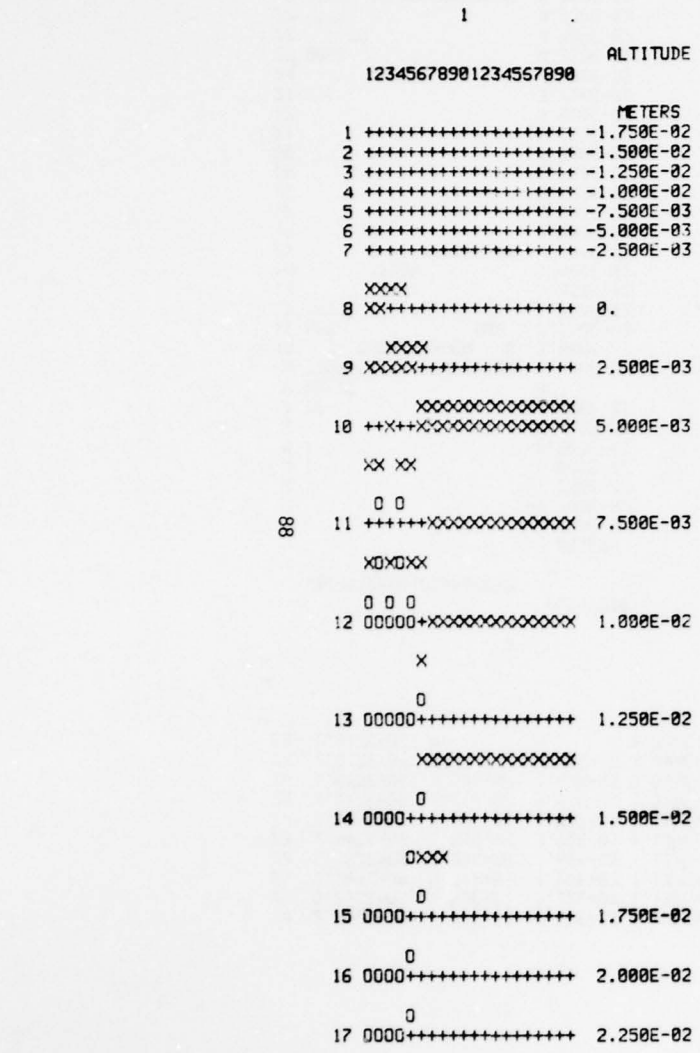
19	2.801E+10	1.89E+02	7.55E+03	1.183E+09	9.670E+00	2.96E+08	-5.31E+08	-1.56E+07	2.75E+00	2.50E-01	3	4.45241E-01
20	8.216E+09	7.93E+01	2.22E+03	1.138E+09	8.952E+00	3.14E+08	-5.30E+08	-1.35E+07	3.00E+00	2.50E-01	3	4.39419E-01
21	2.209E+09	3.01E+01	6.08E+02	1.134E+09	8.914E+00	3.21E+08	-5.29E+08	-1.75E+07	3.25E+00	2.50E-01	3	4.37569E-01
22	5.753E+08	7.55E+00	1.66E+02	1.133E+09	8.904E+00	9.88E+07	-1.61E+08	-5.00E+06	3.50E+00	2.50E-01	3	4.37058E-01
23	1.447E+08	1.55E+00	3.92E+01	1.133E+09	8.901E+00	2.30E+07	-3.75E+07	-1.02E+06	3.75E+00	2.50E-01	3	4.36923E-01
24	2.603E+07	3.44E-01	1.02E+01	1.133E+09	8.901E+00	4.10E+06	-6.05E+06	-1.32E+05	4.00E+00	2.50E-01	3	4.36886E-01
25	1.013E+06	1.71E-02	2.53E+00	1.970E+09	1.334E-03	2.13E+05	-3.07E+05	0.	4.25E+00	2.50E-01	1	6.01320E-05 3 5.34135E-06
26	1.013E+06	3.59E-09	2.83E-03	2.044E+09	1.225E-03	0.	0.	0.	4.50E+00	2.50E-01	1	6.01321E-05
27	1.013E+06	0.	1.78E-12	2.044E+09	1.225E-03	0.	0.	0.	4.75E+00	2.50E-01	1	6.01320E-05
28	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	5.00E+00	2.50E-01	1	6.01320E-05

ENERGY MAP

```
          1         2
                              ALTITUDE
   12345678901234567890

                               METERS
 1                            -1.750E-02
 2                            -1.500E-02
 3                            -1.250E-02
 4                            -1.000E-02
 5                            -7.500E-03
 6                            -5.000E-03
 7 TT                         -2.500E-03
 8 BBTTT                       0.
 9 TTBBBTTTTTTTTTTTTTTTT      2.500E-03
10   T  BBBBBBBBBBB   B       5.000E-03
11 BBB             BBB       7.500E-03
12 TTTT      T                1.000E-02
13     T  TTT                 1.250E-02
14        TBBBB               1.500E-02
15        B TTTTTTTTTTT       1.750E-02
16       TTT                  2.000E-02
17                            2.250E-02
18                            2.500E-02
19     B                      2.750E-02
20                            3.000E-02
21                            3.250E-02
22                            3.500E-02
23                            3.750E-02
24                            4.000E-02
25 BBBB                       4.250E-02
26     TB                     4.500E-02
27 TTTT                       4.750E-02
28 BBBBB BBBBBBBBBBBBBB       5.000E-02
   12345678901234567890
          1         2
```

MATERIAL MAP


1
ALTITUDE
12345678901234557890
METERS
1 -1.750E-02
2 -1.500E-02
3 -1.250E-02
4 -1.000E-02
5 -7.500E-03
6 -5.000E-03
7 -2.500E-03
8 0.
9 2.500E-03
10 5.000E-03
11 7.500E-03
12 1.000E-02
13 1.250E-02
14 1.500E-02
15 1.750E-02
16 2.000E-02
17 2.250E-02

```
        0
18 0000++++++++++++++++  2.500E-02

        0
19 0000++++++++++++++++  2.750E-02

        0
20 0000++++++++++++++++  3.000E-02

        0
21 0000++++++++++++++++  3.250E-02

        0
22 0000++++++++++++++++  3.500E-02

        0
23 0000++++++++++++++++  3.750E-02

        0
24 0000++++++++++++++++  4.000E-02

        0
25 ++++++++++++++++++++  4.250E-02

    0000
26 ++++++++++++++++++++  4.500E-02
27 ++++++++++++++++++++  4.750E-02
28 ++++++++++++++++++++  5.000E-02
    12345678901234567890
              1         2
IN EOS, J =  11 FORMING DPDTAU
N EOS, HIT NTRY LIMIT
N EOS, HIT NTRY LIMIT
N EOS, HIT NTRY LIMIT
N EOS, J =  11 FORMING DPDTAU
N EOS, HIT NTRY LIMIT
N EOS, HIT NTRY LIMIT
N EOS, J =  12 FORMING DPDTAU
   CYCLE    35   TIME 4.1564E-06  DT 1.571E-07   IDT    8  JDT   13
N EOS, HIT NTRY LIMIT
N EOS, J =  13 FORMING DPDTAU
N EOS, HIT NTRY LIMIT
N EOS, HIT NTRY LIMIT
   CYCLE    36   TIME 4.3135E-06  DT 1.574E-07   IDT    8  JDT   13
N EOS, HIT NTRY LIMIT
N EOS, HIT NTRY LIMIT
N EOS, J =  12 FORMING DPDTAU
   CYCLE    37   TIME 4.4709E-06  DT 1.575E-07   IDT    8  JDT   13
N EOS, HIT NTRY LIMIT
N EOS, HIT NTRY LIMIT
N EOS, HIT NTRY LIMIT
N EOS, J =  12 FORMING DPDTAU
N EOS, HIT NTRY LIMIT
N EOS, J =  12 FORMING DPDTAU
```

```
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
   CYCLE    38   TIME 4.6284E-06  DT 1.587E-07   IDT    8  JDT   13
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J =  13 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
   CYCLE    39   TIME 4.7871E-06  DT 1.171E-07   IDT    9  JDT   13
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
   CYCLE    40   TIME 4.9042E-06  DT 9.579E-08   IDT    8  JDT   14
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
   CYCLE    41   TIME 5.0000E-06  DT 1.575E-07   IDT    8  JDT   14
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
+
+
**********
**********
+
PROB    1.2000     CYCLE    41     TIME  5.000000E-06     DT  1.575125E-07
+
+
+
     INTERNAL ENERGY          KINETIC ENERGY           TOTAL ENERGY              ETH                REL ERROR
   1.554124922420B3E+12    2.43621780997421E+13    2.59163030221629E+13    2.59143648720469E+13   -6.466382793308?8E+01
+
                                                      TOTAL MASS                MTH                RELMERR
                                                   6.69586810530000E+02    6.69586810529763E+02    9.23638858292532E-08
+
MAX VEL =  3.28532E+05 AT I   7 J  15
+
MAX CS =   5.86289E+05 AT I   1 J  12
+
MAX TEMP=  3.98466E+03 AT I   7 J  16
+
MAX P =   8.22160E+10 AT I   2 J  18
+
CELL SETTING DT, I   8 J  14
+
+
TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN, 13 SEC
                  OF THIS       0 HOURS,  0 MIN,  0 SEC IS 6600 TIME.
                      AND       0 HOURS,  0 MIN, 13 SEC IS 7600/176 TIME.
+
```

TIME FOR THIS RUN 0 HOURS, 0 MIN, 35 SEC

WHIZ FACTOR TOTAL PROBLEM = 6.03E-04 SEC/CELL/CYCLE

WHIZ FACTOR SINCE LAST DUMP = 7.02E-04 SEC/CELL/CYCLE

I= 1 X(I)= .250 DX(I)= .250

J	P	U	V	XI	RHO	SRR	SZZ	SRZ	Y	DY	M	XM	M	XM
1	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.75E+00	2.50E-01	1	6.01320E-05		
2	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.50E+00	2.50E-01	1	6.01333E-05		
3	1.014E+06	3.46E-02	3.00E+05	2.045E+09	1.226E-03	0.	0.	0.	-1.25E+00	2.50E-01	1	6.01853E-05		
4	1.028E+06	5.36E-01	3.00E+05	2.053E+09	1.238E-03	0.	0.	0.	-1.00E+00	2.50E-01	1	6.07536E-05		
5	1.344E+06	2.36E+01	2.94E+05	2.367E+09	1.410E-03	0.	0.	0.	-7.50E-01	2.50E-01	1	6.91936E-05		
6	5.034E+06	2.93E+02	2.60E+05	6.085E+09	2.158E-03	0.	0.	0.	-5.00E-01	2.50E-01	1	1.05909E-04		
7	8.263E+06	-1.12E+03	2.06E+05	9.191E+09	2.437E-03	0.	0.	0.	-2.50E-01	2.50E-01	1	1.19639E-04		
8	7.235E+06	6.70E+03	1.57E+05	7.908E+09	4.027E+00	1.22E+09	-2.06E+09	0.	0.	2.50E-01	1	4.81461E-05	2	1.97631E-01
9	3.953E+10	3.14E+03	1.29E+05	8.093E+09	7.641E+00	1.05E+09	-2.13E+09	4.90E+07	2.50E-01	2.50E-01	2	3.75087E-01		
10	1.527E+09	7.81E+03	9.07E+04	6.828E+09	7.548E+00	1.42E+09	-2.65E+09	1.15E+07	5.00E-01	2.50E-01	2	3.70497E-01		
11	9.375E+04	4.92E+03	8.59E+04	7.095E+09	3.441E+00	0.	0.	0.	7.50E-01	2.50E-01	3	1.54982E-01	2	1.39149E-02
12	0.	1.14E+04	7.80E+04	7.307E+09	6.349E+00	0.	0.	0.	1.00E+00	2.50E-01	3	3.11670E-01		
13	0.	1.28E+04	7.18E+04	5.987E+09	6.338E+00	0.	0.	0.	1.25E+00	2.50E-01	3	3.11108E-01		
14	0.	1.24E+04	6.32E+04	4.766E+09	7.176E+00	9.37E+07	-2.01E+08	-1.60E+07	1.50E+00	2.50E-01	3	3.52235E-01		
15	-7.324E+10	7.62E+03	4.09E+04	3.414E+09	8.024E+00	2.68E+08	-4.74E+08	-5.91E+07	1.75E+00	2.50E-01	3	3.93887E-01		
16	-5.188E+10	5.07E+03	2.61E+04	2.179E+09	8.475E+00	2.77E+08	-5.06E+08	-4.31E+07	2.00E+00	2.50E-01	3	4.15999E-01		
17	1.317E+10	3.42E+03	2.97E+04	1.683E+09	8.922E+00	2.56E+08	-5.19E+08	-4.17E+07	2.25E+00	2.50E-01	3	4.37933E-01		
18	6.610E+10	2.04E+03	3.10E+04	1.566E+09	9.258E+00	2.38E+08	-5.23E+08	-3.00E+07	2.50E+00	2.50E-01	3	4.54437E-01		
19	7.201E+10	9.81E+02	2.41E+04	1.429E+09	9.307E+00	2.51E+08	-5.27E+08	-2.39E+07	2.75E+00	2.50E-01	3	4.56877E-01		
20	4.503E+10	3.86E+02	1.35E+04	1.247E+09	9.167E+00	2.71E+08	-5.30E+08	-1.87E+07	3.00E+00	2.50E-01	3	4.49984E-01		
21	1.969E+10	1.51E+02	5.64E+03	1.157E+09	9.022E+00	2.88E+08	-5.32E+08	-1.39E+07	3.25E+00	2.50E-01	3	4.42848E-01		
22	6.860E+09	7.30E+01	1.97E+03	1.137E+09	8.943E+00	3.04E+08	-5.31E+08	-1.30E+07	3.50E+00	2.50E-01	3	4.39006E-01		
23	2.133E+09	3.39E+01	6.56E+02	1.134E+09	8.914E+00	3.13E+08	-5.30E+08	-1.67E+07	3.75E+00	2.50E-01	3	4.37545E-01		
24	4.643E+08	1.16E+01	2.63E+02	1.133E+09	8.903E+00	1.02E+08	-1.58E+08	-4.19E+06	4.00E+00	2.50E-01	3	4.37023E-01		
25	1.013E+06	6.69E+00	1.58E+02	1.356E+09	5.004E-03	4.70E+07	-7.11E+07	0.	4.25E+00	2.50E-01	1	6.01240E-05	3	1.85521E-04
26	1.013E+06	2.25E-04	1.75E-01	2.044E+09	1.225E-03	0.	0.	0.	4.50E+00	2.50E-01	1	6.01393E-05		
27	1.013E+06	0.	4.22E-02	2.044E+09	1.225E-03	0.	0.	0.	4.75E+00	2.50E-01	1	6.01321E-05		
28	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	5.00E+00	2.50E-01	1	6.01320E-05		

ENERGY MAP

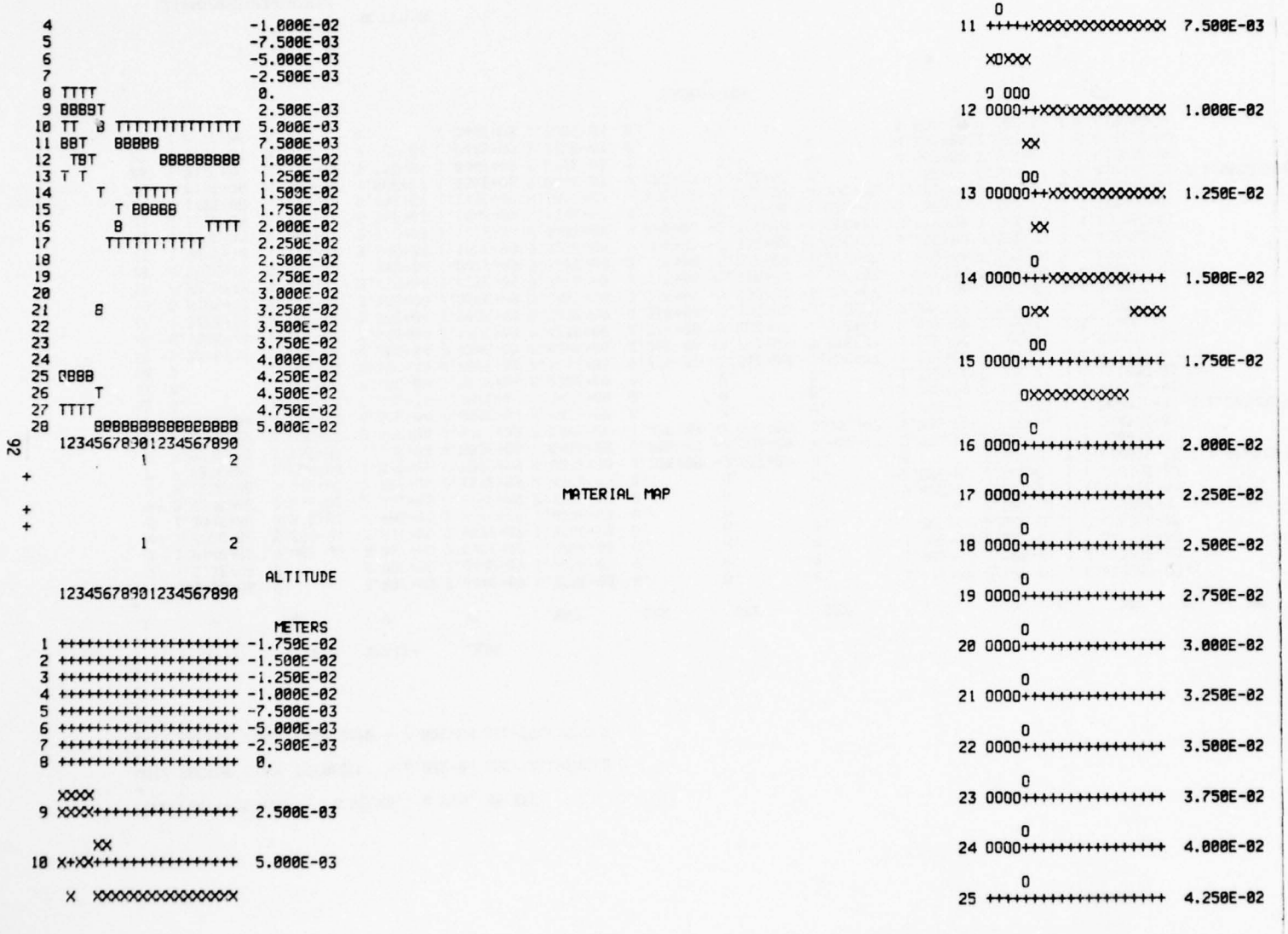
1 2

ALTITUDE

12345678901234567890

METERS

1 -1.750E-02
2 -1.500E-02
3 -1.250E-02


MATERIAL MAP
ALTITUDE
METERS
1234567890123456789
-1.000E-02
-7.500E-03
-5.000E-03
-2.500E-03
0.
2.500E-03
5.000E-03
7.500E-03
1.000E-02
1.250E-02
1.500E-02
1.750E-02
2.000E-02
2.250E-02
2.500E-02
2.750E-02
3.000E-02
3.250E-02
3.500E-02
3.750E-02
4.000E-02
4.250E-02
4.500E-02
4.750E-02
5.000E-02

```
   0000
 26 ++++++++++++++++++++  4.500E-02
 27 ++++++++++++++++++++  4.750E-02
 28 ++++++++++++++++++++  5.000E-02
    12345678901234567890
              1         2
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
   CYCLE    42   TIME 5.1575E-06  DT 1.580E-07   IDT    8  JDT   14
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J =  14 FORMING DPDTAU
   CYCLE    43   TIME 5.3155E-06  DT 1.587E-07   IDT    8  JDT   14
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  14 FORMING DPDTAU
   CYCLE    44   TIME 5.4742E-06  DT 1.595E-07   IDT    8  JDT   14
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
   CYCLE    45   TIME 5.6337E-06  DT 1.603E-07   IDT    8  JDT   14
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
   CYCLE    46   TIME 5.7940E-06  DT 1.133E-07   IDT    8  JDT   15
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
   CYCLE    47   TIME 5.9073E-06  DT 9.272E-08   IDT    8  JDT   15
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
   CYCLE    48   TIME 6.0000E-06  DT 1.587E-07   IDT    8  JDT   15
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
```

```
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
+
+
**********
**********
+
PROB    1.2000     CYCLE    48     TIME  6.000000E-06     DT  1.586964E-07
+
+
+
     INTERNAL ENERGY          KINETIC ENERGY          TOTAL ENERGY              ETH                   REL ERROR
   1.624651142897 73E+12    2.42920367942712E+13    2.591668793716 89E+13    2.59147183840714E+13    1.21169107822903E+00
+
                                                        TOTAL MASS                MTH                   RELMERR
                                                    6.695947600408 04E+02    6.69594760040531E+02    5.43310525140658E-08
+
MAX VEL =  3.21396E+05 AT I   8 J  16
+
MAX CS =   5.36761E+05 AT I   1 J  13
+
MAX TEMP=  4.04067E+03 AT I   5 J  14
+
MAX P =    4.13992E+10 AT I   2 J  20
+
CELL SETTING DT, I   8 J  15
+
+
TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN, 16 SEC
                  OF THIS       0 HOURS,  0 MIN,  0 SEC IS 6600 TIME.
                      AND       0 HOURS,  0 MIN, 16 SEC IS 7600/176 TIME.
+
TIME FOR THIS RUN     0 HOURS,  0 MIN, 38 SEC
+
WHIZ FACTOR TOTAL PROBLEM   = 6.16E-04 SEC/CELL/CYCLE
+
WHIZ FACTOR SINCE LAST DUMP = 6.97E-04 SEC/CELL/CYCLE
+
+
+
+
I=   1  X(I)=      .250   DX(I)=     .250
+
 J       P         U         V         XI        RHO       SRR       SZZ       SRZ        Y        DY    M      XM      M      XM
+
  1  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.75E+00 2.50E-01 1 6.01320E-05
  2  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.50E+00 2.50E-01 1 6.01336E-05
  3  1.014E+06  4.43E-02  3.00E+05 2.045E+09 1.226E-03  0.        0.        0.       -1.25E+00 2.50E-01 1 6.01762E-05
  4  1.026E+06  6.16E-01  3.00E+05 2.052E+09 1.236E-03  0.        0.        0.       -1.00E+00 2.50E-01 1 6.06772E-05
  5  1.105E+06  1.65E+01  2.96E+05 2.218E+09 1.334E-03  0.        0.        0.       -7.50E-01 2.50E-01 1 6.55059E-05
  6  2.946E+06  1.61E+02  2.76E+05 4.292E+09 1.748E-03  0.        0.        0.       -5.00E-01 2.50E-01 1 8.58252E-05
  7  8.240E+06 -2.42E+02  2.36E+05 8.245E+09 2.677E-03  0.        0.        0.       -2.50E-01 2.50E-01 1 1.31413E-04
```

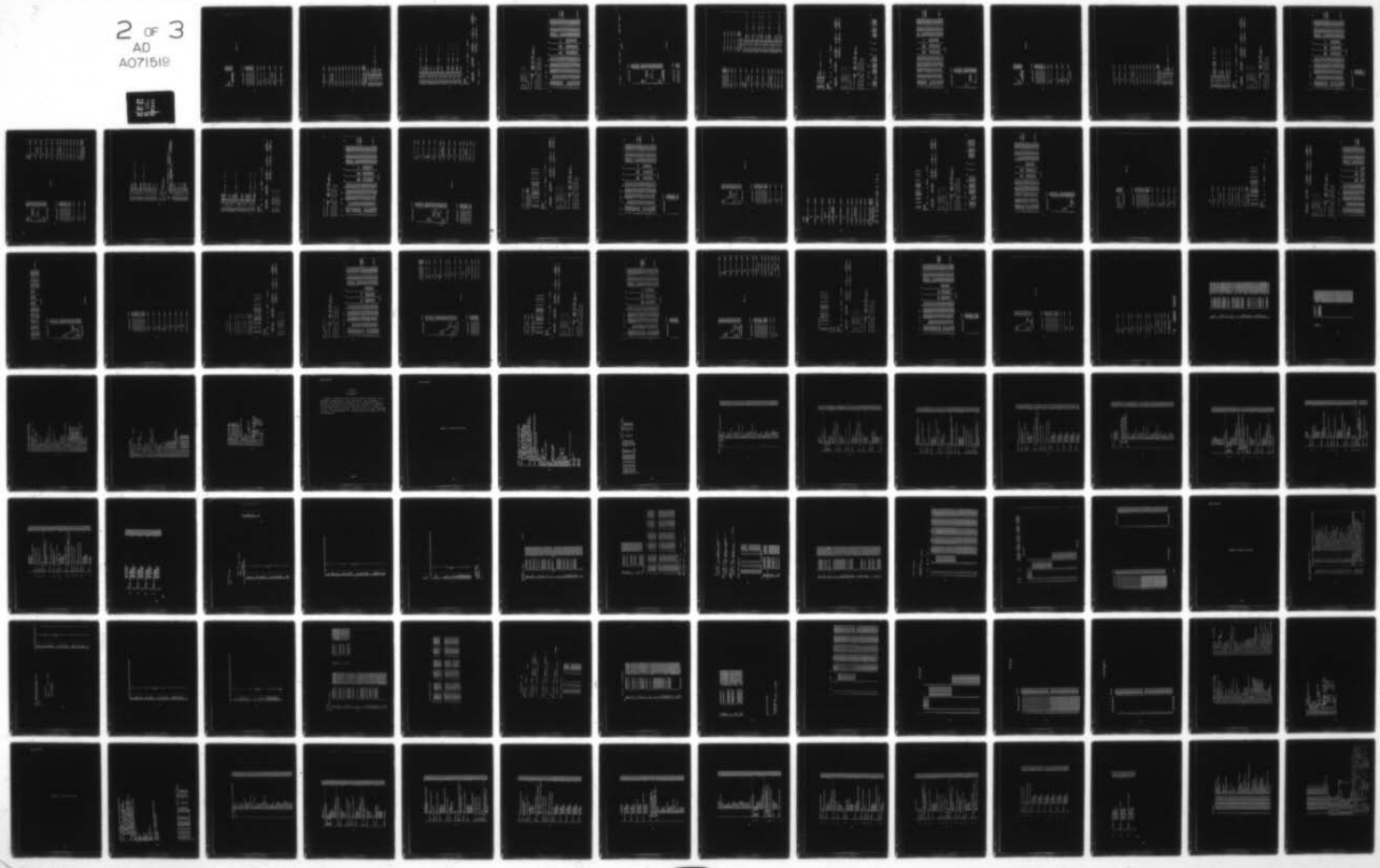
```
 8  8.498E+06  6.92E+03  1.44E+05 9.517E+09 2.431E-03  0.        0.        0.        0.       2.50E-01 1 1.19319E-04
 9  1.438E+07  4.10E+03  1.30E+05 8.112E+09 7.425E+00  8.57E+08 -1.99E+09  0.        2.50E-01 2.50E-01 1 1.35349E-06 2 3.64456E-01
10 -1.974E+10  4.28E+03  1.19E+05 7.797E+09 7.364E+00  1.20E+09 -2.11E+09  1.51E+08  5.00E-01 2.50E-01 2 3.61472E-01
11  8.216E+04  5.08E+03  9.92E+04 7.414E+09 3.147E+00  4.76E+08 -8.30E+08  0.        7.50E-01 2.50E-01 1 2.87852E-06 2 1.54475E-01
IN EOS, J =  28 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
12  1.158E+03  9.70E+03  8.11E+04 7.799E+09 6.126E+00  0.        0.        0.        1.00E+00 2.50E-01 3 2.99866E-01 2 8.68102E-04
13  0.         1.17E+04  7.44E+04 7.096E+09 5.412E+00  0.        0.        0.        1.25E+00 2.50E-01 3 2.65663E-01
14  0.         1.27E+04  7.32E+04 5.797E+09 5.874E+00  0.        0.        0.        1.50E+00 2.50E-01 3 2.88350E-01
15 -6.036E+09  1.14E+04  6.48E+04 4.555E+09 7.300E+00  1.11E+08 -2.44E+08 -2.48E+07  1.75E+00 2.50E-01 3 3.58339E-01
16 -8.012E+10  5.87E+03  3.31E+04 3.074E+09 8.143E+00  2.58E+08 -4.83E+08 -5.88E+07  2.00E+00 2.50E-01 3 3.99731E-01
17 -9.099E+10  3.82E+03  1.06E+04 2.123E+09 8.259E+00  2.82E+08 -5.08E+08 -3.35E+07  2.25E+00 2.50E-01 3 4.05409E-01
18 -5.621E+10  2.53E+03  9.85E+03 1.572E+09 8.509E+00  2.98E+08 -5.20E+08 -2.79E+07  2.50E+00 2.50E-01 3 4.17707E-01
19 -3.977E+09  1.70E+03  1.51E+04 1.314E+09 8.854E+00  2.47E+08 -5.29E+08 -1.15E+07  2.75E+00 2.50E-01 3 4.34636E-01
20  3.057E+10  1.00E+03  1.70E+04 1.260E+09 9.077E+00  2.42E+08 -5.30E+08 -1.29E+07  3.00E+00 2.50E-01 3 4.45508E-01
21  3.671E+10  4.99E+02  1.36E+04 1.222E+09 9.119E+00  2.56E+08 -5.31E+08 -1.37E+07  3.25E+00 2.50E-01 3 4.47642E-01
22  2.479E+10  2.18E+02  8.10E+03 1.170E+09 9.052E+00  2.72E+08 -5.32E+08 -1.23E+07  3.50E+00 2.50E-01 3 4.44332E-01
23  1.163E+10  1.02E+02  3.91E+03 1.142E+09 8.973E+00  2.85E+08 -5.33E+08 -9.35E+06  3.75E+00 2.50E-01 3 4.40455E-01
24  2.878E+09  8.38E+01  1.96E+03 1.134E+09 8.918E+00  3.35E+08 -5.27E+08 -3.63E+06  4.00E+00 2.50E-01 3 4.37774E-01
25  1.015E+06  8.54E+01  1.47E+03 1.161E+09 4.139E-02  3.46E+08 -5.25E+08  0.        4.25E+00 2.50E-01 1 5.99581E-05 3 1.97163E-03
26  1.016E+06  7.02E-02  4.70E+00 2.046E+09 1.228E-03  0.        0.        0.        4.50E+00 2.50E-01 1 6.02853E-05
27  1.013E+06  2.94E-08  1.68E+00 2.044E+09 1.225E-03  0.        0.        0.        4.75E+00 2.50E-01 1 6.01322E-05
28  1.013E+06  0.        0.       2.044E+09 1.225E-03  0.        0.        0.        5.00E+00 2.50E-01 1 6.01320E-05
+
                                                    ENERGY MAP
+
+
95              1         2

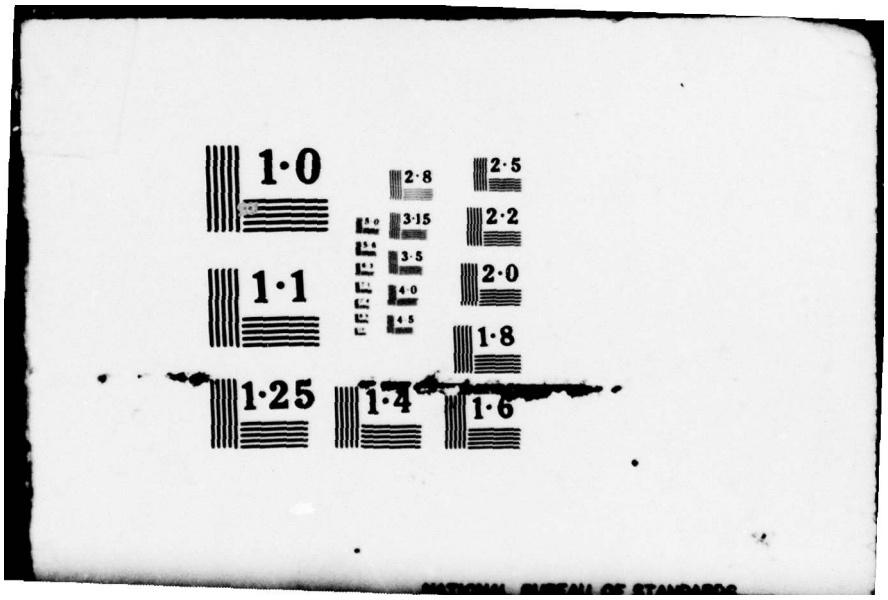
                                  ALTITUDE
    12345678901234567890

                                    METERS
 1                                -1.750E-02
 2                                -1.500E-02
 3                                -1.250E-02
 4                                -1.000E-02
 5                                -7.500E-03
 6                                -5.000E-03
 7                                -2.500E-03
 8  T                              0.
 9 T TT                            2.500E-03
10   BBT                          5.000E-03
11  B  B  TTT       TTT           7.500E-03
12 B      BB TTTTTTT              1.000E-02
13 TTTT     BBBBBBBBBBB           1.250E-02
14    T                           1.500E-02
15          TTT                   1.750E-02
16        TT  BBB                 2.000E-02
17        BB                      2.250E-02
18      TTTTTTTTTTTTTT            2.500E-02
19                                2.750E-02
20                                3.000E-02
21                                3.250E-02
```

AD-A071 519 AIR FORCE WEAPONS LAB KIRTLAND AFB NM F/G 15/6
THE INSTALLATION AND OPERATION OF HULL ON 370S. PART 1. (U)
JAN 79 L P GABY, M A FRY, C E RHOADES
UNCLASSIFIED AFWL-TR-78-134-PT-1 SBIE-AD-E200 324 NL

2 OF 3
AD
A071519

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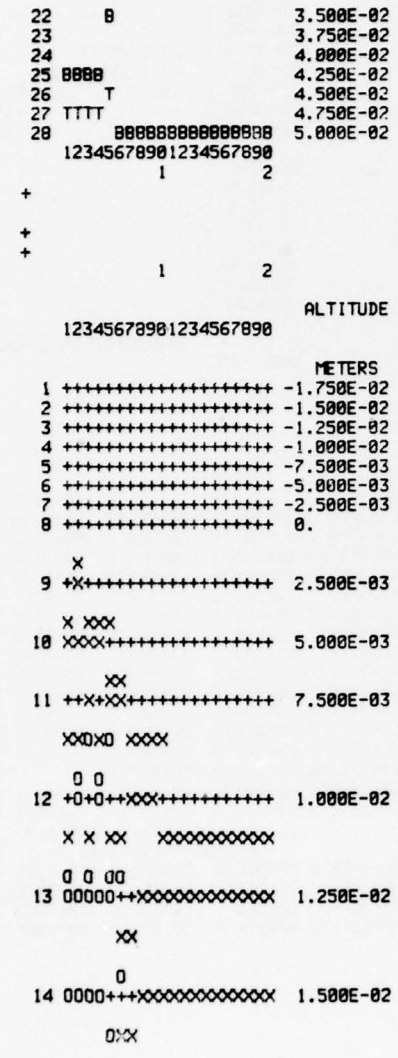


MATERIAL MAP

```
        00
15 0000+++xxxxxxxxxxxx  1.750E-02

        00x

         0
16 0000+++++++++++++++  2.000E-02

        00xxxxxxxxxxxxx
17 0000+++++++++++++++  2.250E-02

         0
18 0000+++++++++++++++  2.500E-02

         0
19 0000+++++++++++++++  2.750E-02

         0
20 0000+++++++++++++++  3.000E-02

         0
21 0000+++++++++++++++  3.250E-02

         0
22 0000+++++++++++++++  3.500E-02

         0
23 0000+++++++++++++++  3.750E-02

         0
24 0000+++++++++++++++  4.000E-02

         0
25 +++++++++++++++++++  4.250E-02

   0000
26 +++++++++++++++++++  4.500E-02
27 +++++++++++++++++++  4.750E-02
28 +++++++++++++++++++  5.000E-02
   12345678901234567890
             1         2
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
   CYCLE    49   TIME 6.1587E-06  DT 1.591E-07   IDT    8  JDT   15
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
IN EOS, J =  13 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
```

```
IN EOS, HIT NTRY LIMIT
   CYCLE    50   TIME 6.3178E-06  DT 1.597E-07   IDT    8  JDT   15
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J =  13 FORMING DPDTAU
   CYCLE    51   TIME 6.4775E-06  DT 1.604E-07   IDT    8  JDT   15
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  11 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  13 FORMING DPDTAU
   CYCLE    52   TIME 6.6379E-06  DT 1.581E-07   IDT    8  JDT   16
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  11 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  13 FORMING DPDTAU
   CYCLE    53   TIME 6.7960E-06  DT 1.122E-07   IDT    8  JDT   16
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  13 FORMING DPDTAU
   CYCLE    54   TIME 6.9082E-06  DT 9.180E-08   IDT    8  JDT   16
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  13 FORMING DPDTAU
   CYCLE    55   TIME 7.0000E-06  DT 1.594E-07   IDT    8  JDT   16
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  13 FORMING DPDTAU
+
+
**********
**********
+
PROB    1.2000     CYCLE    55     TIME  7.000000E-06     DT  1.594394E-07
+
+
+
     INTERNAL ENERGY          KINETIC ENERGY          TOTAL ENERGY              ETH                REL ERROR
   1.68128800743937E+12    2.42325375877146E+13    2.59138255951539E+13    2.59125780381940E+13   -2.78606498948739E+01
+
                                                        TOTAL MASS              MTH                  RELMERR
                                                    6.69552879679039E+02    6.69552879678766E+02    8.
+
MAX VEL =  3.17009E+05 AT I   8 J  18
```

```
+
MAX CS =   5.52316E+05 AT I   1 J  14
+
MAX TEMP=   4.49931E+03 AT I   8 J  17
+
MAX P =   3.58097E+10 AT I   6 J  13
+
CELL SETTING DT, I   8 J  16
+
+
TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN, 19 SEC
                  OF THIS       0 HOURS,  0 MIN,  0 SEC IS 6600 TIME.
                     AND        0 HOURS,  0 MIN, 19 SEC IS 7600/176 TIME.
+
TIME FOR THIS RUN     0 HOURS,  0 MIN, 41 SEC
+
WHIZ FACTOR TOTAL PROBLEM   = 6.29E-04 SEC/CELL/CYCLE
+
WHIZ FACTOR SINCE LAST DUMP = 7.07E-04 SEC/CELL/CYCLE
+
+
+
+
I=   1  X(I)=      .250   DX(I)=     .250
+
 J       P         U         V         XI        RHO       SRR       SZZ       SRZ       Y        DY    M      XM     M      XM
+
  1  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.75E+00 2.50E-01 1 6.01320E-05
  2  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.50E+00 2.50E-01 1 6.01336E-05
  3  1.014E+06  4.01E-02  3.00E+05 2.044E+09 1.226E-03  0.        0.        0.       -1.25E+00 2.50E-01 1 6.01635E-05
  4  1.022E+06  4.94E-01  3.00E+05 2.049E+09 1.233E-03  0.        0.        0.       -1.00E+00 2.50E-01 1 6.05148E-05
  5  1.109E+06  9.15E+00  2.98E+05 2.128E+09 1.290E-03  0.        0.        0.       -7.50E-01 2.50E-01 1 6.33007E-05
  6  1.917E+06  7.82E+01  2.86E+05 3.149E+09 1.527E-03  0.        0.        0.       -5.00E-01 2.50E-01 1 7.49423E-05
  7  5.465E+06 -1.53E+02  2.55E+05 6.471E+09 2.214E-03  0.        0.        0.       -2.50E-01 2.50E-01 1 1.08659E-04
  8  1.085E+07  2.87E+03  1.99E+05 1.025E+10 2.908E-03  0.        0.        0.        0.       2.50E-01 1 1.42728E-04
  9  9.610E+06  3.51E+03  1.35E+05 8.091E+09 3.227E+00  8.42E+08 -1.95E+09  0.        2.50E-01 2.50E-01 1 7.19763E-05 2 1.58315E-01
 10 -1.875E+10  4.74E+03  1.25E+05 8.105E+09 7.340E+00  1.01E+09 -1.96E+09  9.55E+07  5.00E-01 2.50E-01 2 3.60282E-01
 11  8.087E+04  4.74E+03  1.07E+05 7.767E+09 6.184E+00  1.17E+09 -2.14E+09  0.        7.50E-01 2.50E-01 1 8.43920E-07 2 3.03544E-01
 12  4.187E+04  9.70E+03  8.16E+04 7.803E+09 2.403E+00  0.        0.        0.        1.00E+00 2.50E-01 3 1.17314E-01 2 6.18227E-04
 13  0.         9.35E+03  7.65E+04 7.769E+09 5.591E+00  0.        0.        0.        1.25E+00 2.50E-01 3 2.74432E-01
 14  0.         1.14E+04  7.37E+04 6.924E+09 4.921E+00  0.        0.        0.        1.50E+00 2.50E-01 3 2.41569E-01
 15  0.         1.29E+04  7.60E+04 5.482E+09 6.114E+00  2.47E+07 -5.20E+07 -6.11E+06  1.75E+00 2.50E-01 3 3.00115E-01
 16 -5.267E+10  4.81E+03  5.74E+04 3.592E+09 8.101E+00  2.37E+08 -4.34E+08 -9.09E+07  2.00E+00 2.50E-01 3 3.97651E-01
 17 -4.618E+10  3.87E+03  2.29E+04 2.369E+09 8.489E+00  2.43E+08 -5.03E+08 -3.71E+07  2.25E+00 2.50E-01 3 4.16701E-01
 18 -8.816E+10  2.15E+03  3.99E+03 1.909E+09 8.294E+00  2.91E+08 -5.12E+08 -3.69E+07  2.50E+00 2.50E-01 3 4.07146E-01
 19 -8.359E+10  1.51E+03 -2.79E+03 1.611E+09 8.348E+00  3.49E+08 -5.11E+08  1.53E+07  2.75E+00 2.50E-01 3 4.09782E-01
 20 -4.913E+10  9.97E+02  1.42E+03 1.328E+09 8.576E+00  3.85E+08 -4.43E+08  2.11E+08  3.00E+00 2.50E-01 3 4.20965E-01
 21 -1.185E+10  6.83E+02  6.89E+03 1.194E+09 8.823E+00  2.14E+08 -5.23E+08  6.79E+07  3.25E+00 2.50E-01 3 4.33100E-01
 22  1.101E+10  4.12E+02  9.14E+03 1.166E+09 8.966E+00  2.38E+08 -5.31E+08  1.28E+07  3.50E+00 2.50E-01 3 4.40128E-01
 23  1.478E+10  2.87E+02  8.36E+03 1.153E+09 8.991E+00  2.49E+08 -5.33E+08 -1.37E+05  3.75E+00 2.50E-01 3 4.41365E-01
 24  5.571E+09  1.20E+02  5.67E+03 1.140E+09 8.935E+00  3.14E+08 -5.30E+08  7.63E+06  4.00E+00 2.50E-01 3 4.38587E-01
 25  1.021E+06  1.62E+02  5.36E+03 1.144E+09 2.017E-01  3.32E+08 -5.27E+08  0.        4.25E+00 2.50E-01 1 5.90750E-05 3 9.84032E-03
 26  1.034E+06  1.59E+00  7.06E+01 2.056E+09 1.244E-03  0.        0.        0.        4.50E+00 2.50E-01 1 6.10627E-05
 27  1.013E+06  1.73E-05  1.68E+01 2.044E+09 1.225E-03  0.        0.        0.        4.75E+00 2.50E-01 1 6.01353E-05
```

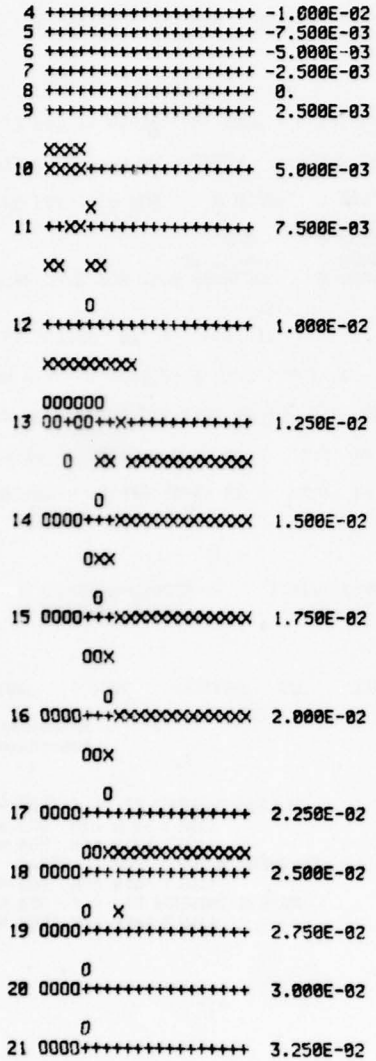
```
 28  1.013E+06  0.        0.       2.044E+09 1.225E-03  0.        0.        0.        5.00E+00 2.50E-01 1 6.01320E-05
+
                                                                ENERGY MAP
+
+
            1         2

                                    ALTITUDE
    12345678901234567890

                                      METERS
  1                                -1.750E-02
  2                                -1.500E-02
  3                                -1.250E-02
  4                                -1.000E-02
  5                                -7.500E-03
  6                                -5.000E-03
  7                                -2.500E-03
  8                                 0.
  9 TTTT                            2.500E-03
 10 BBBBT                           5.000E-03
 11 TT  B                           7.500E-03
 12 BB                              1.000E-02
 13 TTTT    TTTTTTTTTTT             1.250E-02
 14     T   BBBBBBBBBBB             1.500E-02
 15                                 1.750E-02
 16       T    TT                   2.000E-02
 17        T   BB                   2.250E-02
 18       BB                        2.500E-02
 19      TT TTTTTTTTTTT             2.750E-02
 20        T                        3.000E-02
 21                                 3.250E-02
 22                                 3.500E-02
 23     B                           3.750E-02
 24                                 4.000E-02
 25 BBBB                            4.250E-02
 26     T   B                       4.500E-02
 27 TTTT                            4.750E-02
 28       BB BBBBBBBBBB             5.000E-02
    12345678901234567890
            1         2
+
                                                                MATERIAL MAP
+
+
            1         2

                                    ALTITUDE
    12345678901234567890

                                      METERS
  1 ++++++++++++++++++++ -1.750E-02
  2 ++++++++++++++++++++ -1.500E-02
  3 ++++++++++++++++++++ -1.250E-02
```




```
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  13 FORMING DPDTAU
   CYCLE    56   TIME 7.1594E-06  DT 1.578E-07   IDT    8  JDT   17
IN EOS, HIT NTRY LIMIT
IN EOS, J =  13 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
   CYCLE    57   TIME 7.3173E-06  DT 1.581E-07   IDT    8  JDT   17
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  13 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
   CYCLE    58   TIME 7.4754E-06  DT 1.585E-07   IDT    8  JDT   17
IN EOS, HIT NTRY LIMIT
IN EOS, J =  13 FORMING DPDTAU
   CYCLE    59   TIME 7.6339E-06  DT 1.589E-07   IDT    8  JDT   17
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  13 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J =  13 FORMING DPDTAU
   CYCLE    60   TIME 7.7928E-06  DT 1.139E-07   IDT    8  JDT   17
IN EOS, J =  13 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  13 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J =  15 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
   CYCLE    61   TIME 7.9068E-06  DT 9.323E-08   IDT    8  JDT   17
IN EOS, HIT NTRY LIMIT
IN EOS, J =  13 FORMING DPDTAU
```

```
IN EOS, HIT NTRY LIMIT
IN EOS, J =  15 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
  CYCLE    62   TIME 8.0000E-06  DT 1.602E-07   IDT    8  JDT   17
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  13 FORMING DPDTAU
+
+
**********
**********
+
PROB    1.2000     CYCLE    62     TIME  8.000000E-06     DT  1.601803E-07
+
+
+
     INTERNAL ENERGY          KINETIC ENERGY          TOTAL ENERGY              ETH                REL ERROR
   1.729226404869 92E+12    2.4176771459313 1F+13    2.590599786338 30E+13    2.590660878138 76E+13   -7.173403079857 42E+01
+
                                                      TOTAL MASS                MTH                RELMERR
                                                    6.694323883582 66E+02    6.694323883579 02E+02    1.358605764509 76E-07
+
MAX VEL =  3.12918E+05 AT I   8 J  19
+
MAX CS =   5.65957E+05 AT I   1 J  14
+
MAX TEMP=  4.45281E+03 AT I   8 J  18
+
MAX P =   3.52901E+10 AT I   2 J  17
+
CELL SETTING DT, I   8 J  17
+
+
TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN, 22 SEC
                 OF THIS        0 HOURS,  0 MIN,  0 SEC IS 6600 TIME.
                     AND        0 HOURS,  0 MIN, 22 SEC IS 7600/176 TIME.
+
TIME FOR THIS RUN     0 HOURS,  0 MIN, 44 SEC
+
WHIZ FACTOR TOTAL PROBLEM   = 6.36E-04 SEC/CELL/CYCLE
+
WHIZ FACTOR SINCE LAST DUMP = 6.99E-04 SEC/CELL/CYCLE
+
+
+
+
I=   1  X(I)=      .250   DX(I)=     .250
+
 J       P         U         V         XI        RHO       SRR       SZZ       SRZ        Y        DY    M      XM     M      XM
+
  1  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.75E+00 2.50E-01 1 6.01320E-05
  2  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.50E+00 2.50E-01 1 6.01333E-05
  3  1.013E+06  2.91E-02  3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.25E+00 2.50E-01 1 6.01524E-05
  4  1.019E+06  3.24E-01  3.00E+05 2.047E+09 1.230E-03  0.        0.        0.       -1.00E+00 2.50E-01 1 6.03674E-05
```

5	1.063E+06	4.32E+00	2.99E+05	2.084E+09	1.262E-03	0.	0.	0.	-7.50E-01	2.50E-01	1	6.19609E-05	
6	1.434E+06	3.10E+01	2.92E+05	2.543E+09	1.404E-03	0.	0.	0.	-5.00E-01	2.50E-01	1	6.88959E-05	
7	3.464E+06	-1.46E+02	2.69E+05	4.808E+09	1.848E-03	0.	0.	0.	-2.50E-01	2.50E-01	1	9.06923E-05	
8	9.798E+06	1.14E+03	2.26E+05	9.221E+09	2.882E-03	0.	0.	0.	0.	2.50E-01	1	1.41448E-04	
9	1.082E+07	2.93E+03	1.57E+05	1.061E+10	2.811E-03	0.	0.	0.	2.50E-01	2.50E-01	1	1.37982E-04	
10	8.844E+06	5.34E+03	1.31E+05	8.301E+09	6.512E+00	9.85E+08	-1.86E+09	0.	5.00E-01	2.50E-01	1	1.46635E-05	2 3.19631E-01
11	-1.243E+10	2.47E+03	1.14E+05	8.037E+09	7.390E+00	1.09E+09	-2.00E+09	1.22E+06	7.50E-01	2.50E-01	2	3.62776E-01	
12	4.732E+04	4.03E+03	1.06E+05	7.998E+09	1.825E+00	1.07E+09	-2.02E+09	0.	1.00E+00	2.50E-01	1	2.10592E-06	2 8.95687E-02
13	8.953E+03	7.23E+03	7.90E+04	7.988E+09	5.103E+00	0.	0.	0.	1.25E+00	2.50E-01	3	2.50398E-01	2 9.59924E-05
14	0.	9.14E+03	7.66E+04	7.720E+09	4.641E+00	0.	0.	0.	1.50E+00	2.50E-01	3	2.27822E-01	
15	0.	9.60E+03	8.09E+04	6.297E+09	5.149E+03	0.	0.	0.	1.75E+00	2.50E-01	3	2.52744E-01	
16	-3.097E+10	-1.68E+02	6.20E+04	3.974E+09	8.095E+00	2.11E+08	-3.47E+08	-9.53E+07	2.00E+00	2.50E-01	3	3.97366E-01	
17	3.795E+10	1.61E+03	3.36E+04	2.554E+09	8.979E+00	2.18E+08	-5.02E+08	-1.18E+07	2.25E+00	2.50E-01	3	4.40752E-01	
18	-2.236E+09	5.33E+02	2.23E+04	1.766E+09	8.815E+00	2.61E+09	-5.17E+08	-4.03E+07	2.50E+00	2.50E-01	3	4.32711E-01	
19	-4.532E+10	2.87E+02	3.01E+03	1.539E+09	8.577E+00	2.82E+08	-5.23E+08	-8.34E+05	2.75E+00	2.50E-01	3	4.21019E-01	
20	-7.452E+10	3.26E+02	-6.46E+03	1.503E+09	8.410E+00	4.14E+08	-4.72E+08	8.74E+07	3.00E+00	2.50E-01	3	4.12827E-01	
21	-6.650E+10	1.79E+02	-6.49E+03	1.379E+09	8.469E+00	-1.35E+08	4.85E+08	1.44E+08	3.25E+00	2.50E-01	3	4.15702E-01	
22	-4.193E+10	1.12E+02	-1.01E+03	1.234E+09	8.629E+00	-2.53E+08	5.13E+08	1.19E+08	3.50E+00	2.50E-01	3	4.23559E-01	
23	-1.771E+10	3.59E+01	4.74E+03	1.161E+09	8.705E+00	-3.69E+08	3.81E+08	2.68E+08	3.75E+00	2.50E-01	3	4.31232E-01	
24	-5.049E+09	3.74E+01	7.65E+03	1.141E+09	8.867E+00	1.78E+08	-3.70E+08	3.02E+08	4.00E+00	2.50E-01	3	4.35255E-01	
25	1.023E+06	1.69E+02	7.58E+03	1.143E+09	4.878E-01	3.02E+08	-5.18E+08	0.	4.25E+00	2.50E-01	1	5.71578E-05	3 2.38867E-02
26	1.074E+06	3.68E+00	3.26E+02	2.078E+09	1.278E-03	0.	0.	0.	4.50E+00	2.50E-01	1	6.27160E-05	
27	1.014E+06	-2.40E-02	7.65E+01	2.044E+09	1.226E-03	0.	0.	0.	4.75E+00	2.50E-01	1	6.01575E-05	
28	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	5.00E+00	2.50E-01	1	6.01320E-05	

ENERGY MAP

103

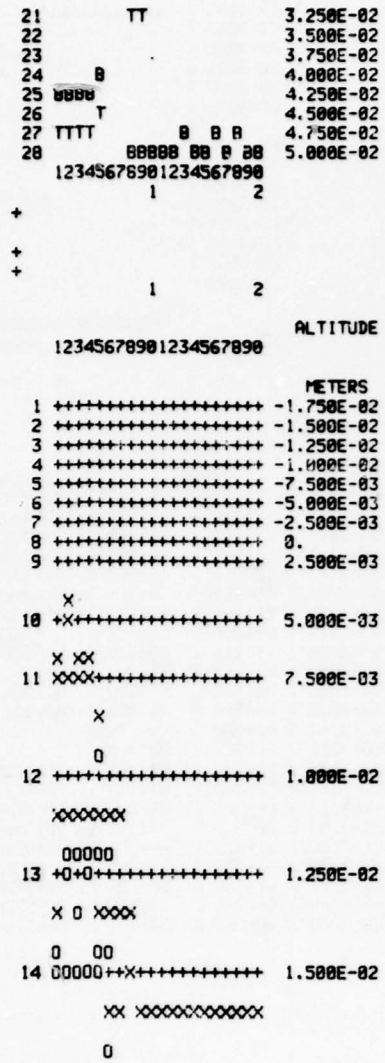
1 2

ALTITUDE

12345678901234567890

METERS

1		-1.750E-02
2		-1.500E-02
3		-1.250E-02
4		-1.000E-02
5		-7.500E-03
6		-5.000E-03
7		-2.500E-03
8		0.
9	T	2.500E-03
10	T TT	5.000E-03
11	BBT	7.500E-03
12	B	1.000E-02
13	T	1.250E-02
14	TT TTTTTTTTTTT	1.500E-02
15	T BBBBBBBBBBB	1.750E-02
16		2.000E-02
17	T	2.250E-02
18	T T	2.500E-02
19	TB B	2.750E-02
20	TB TTTTTTTTTT	3.000E-02



MATERIAL MAP

IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J = 13 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J = 14 FORMING DPDTAU
CYCLE 63 TIME 8.1602E-06 DT 1.586E-07 IDT 8 JDT 18
IN EOS, J = 13 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J = 13 FORMING DPDTAU

```
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
   CYCLE    64   TIME 8.3188E-06  DT 1.590E-07   IDT    8  JDT   18
   CYCLE    65   TIME 8.4779E-06  DT 1.595E-07   IDT    8  JDT   18
   CYCLE    66   TIME 8.6373E-06  DT 1.599E-07   IDT    8  JDT   18
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J =  16 FORMING DPDTAU
   CYCLE    67   TIME 8.7973E-06  DT 1.115E-07   IDT    8  JDT   18
IN EOS, J =  17 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
   CYCLE    68   TIME 8.9088E-06  DT 9.124E-08   IDT    9  JDT   19
IN EOS, J =  17 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
   CYCLE    69   TIME 9.0000E-06  DT 1.606E-07   IDT    9  JDT   19
+
+
**********
**********
+
PROB    1.2000     CYCLE    69     TIME  9.000000E-06     DT  1.605726E-07
+
+
+
     INTERNAL ENERGY          KINETIC ENERGY           TOTAL ENERGY              ETH                 REL ERROR
   1.77378202501109E+12    2.41187602679320E+13    2.58925422929430E+13    2.58970040760514E+13   -1.48702758729686E+02
+
                                                      TOTAL MASS              MTH                 RELMERR
                                                   6.69233202903382E+02    6.69233202902982E+02    5.43604051817681E-08
+
MAX VEL =  3.10555E+05 AT I   9 J  20
+
MAX CS =   5.59930E+05 AT I   1 J  15
+
MAX TEMP=  4.06081E+03 AT I   8 J  19
+
MAX P =   7.06898E+10 AT I   1 J  18
+
CELL SETTING DT, I   9 J  19
+
+
TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN, 24 SEC
                  OF THIS       0 HOURS,  0 MIN,  0 SEC IS 6600 TIME.
                      AND       0 HOURS,  0 MIN, 24 SEC IS 7600/176 TIME.
+
TIME FOR THIS RUN     0 HOURS,  0 MIN, 46 SEC
+
WHIZ FACTOR TOTAL PROBLEM   = 6.40E-04 SEC/CELL/CYCLE
+
WHIZ FACTOR SINCE LAST DUMP = 6.67E-04 SEC/CELL/CYCLE
-
```

I= 1 X(I)= .250 DX(I)= .250

J	P	U	V	XI	RHO	SRR	SZZ	SRZ	Y	DY	M	XM	M	XM
1	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.75E+00	2.50E-01	1	6.01320E-05		
2	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.50E+00	2.50E-01	1	6.01330E-05		
3	1.013E+06	1.80E-02	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.25E+00	2.50E-01	1	6.01445E-05		
4	1.016E+06	1.83E-01	3.00E+05	2.046E+09	1.228E-03	0.	0.	0.	-1.00E+00	2.50E-01	1	6.02657E-05		
5	1.039E+06	1.74E+00	2.99E+05	2.063E+09	1.246E-03	0.	0.	0.	-7.50E-01	2.50E-01	1	6.11544E-05		
6	1.213E+06	8.79E+00	2.96E+05	2.260E+09	1.331E-03	0.	0.	0.	-5.00E-01	2.50E-01	1	6.53201E-05		
7	2.279E+06	-1.26E+02	2.80E+05	3.564E+09	1.613E-03	0.	0.	0.	-2.50E-01	2.50E-01	1	7.91669E-05		
8	6.458E+06	4.37E+01	2.46E+05	7.290E+09	2.344E-03	0.	0.	0.	0.	2.50E-01	1	1.15071E-04		
9	1.232E+07	1.56E+03	1.96E+05	1.078E+10	3.157E-03	0.	0.	0.	2.50E-01	2.50E-01	1	1.54969E-04		
10	1.127E+07	6.35E+03	1.35E+05	8.283E+09	2.515E+00	9.84E+08	-1.85E+09	0.	5.00E-01	2.50E-01	1	9.35151E-05	2	1.23382E-01
11	-1.570E+10	4.02E+03	1.21E+05	8.289E+09	7.342E+00	1.00E+09	-1.86E+09	1.26E+07	7.50E-01	2.50E-01	2	3.60413E-01		
12	4.971E+04	3.65E+03	1.10E+05	8.133E+09	5.114E+00	1.09E+09	-1.94E+09	0.	1.00E+00	2.50E-01	1	9.20653E-07	2	2.51023E-01
13	2.696E+04	7.23E+03	7.95E+04	7.994E+09	1.851E+00	0.	0.	0.	1.25E+00	2.50E-01	3	9.07735E-02	2	8.88273E-05
14	0.	7.72E+03	7.83E+04	8.114E+09	5.115E+00	0.	0.	0.	1.50E+00	2.50E-01	3	2.51085E-01		
15	0.	7.88E+03	7.72E+04	7.110E+09	4.739E+00	0.	0.	0.	1.75E+00	2.50E-01	3	2.32632E-01		
16	-3.428E+08	-5.51E+02	5.20E+04	4.591E+09	8.138E+00	1.27E+08	-2.31E+08	-4.94E+07	2.00E+00	2.50E-01	3	3.99479E-01		
17	6.504E+10	1.50E+03	2.89E+04	2.078E+09	9.108E+00	2.04E+08	-4.96E+08	-1.63E+07	2.25E+00	2.50E-01	3	4.47095E-01		
18	7.328E+10	1.36E+02	3.20E+04	2.031E+09	9.249E+00	1.59E+08	-4.64E+08	-1.82E+08	2.50E+00	2.50E-01	3	4.54025E-01		
19	7.011E+10	-6.55E+02	2.33E+04	1.646E+09	9.273E+00	2.11E+08	-5.17E+08	-5.53E+07	2.75E+00	2.50E-01	3	4.55168E-01		
20	1.529E+10	-1.22E+03	1.05E+04	1.353E+09	8.972E+00	2.74E+08	-5.28E+08	-2.53E+06	3.00E+00	2.50E-01	3	4.40415E-01		
21	-3.281E+10	-9.09E+02	-2.06E+03	1.302E+09	8.677E+00	3.51E+08	-5.01E+08	1.09E+08	3.25E+00	2.50E-01	3	4.25921E-01		
22	-5.374E+10	-7.25E+02	-6.79E+03	1.312E+09	8.550E+00	-6.03E+07	4.29E+08	2.19E+08	3.50E+00	2.50E-01	3	4.19699E-01		
23	-4.441E+10	-3.64E+02	-5.34E+03	1.248E+09	8.612E+00	-1.97E+08	4.99E+08	1.48E+08	3.75E+00	2.50E-01	3	4.22756E-01		
24	-1.916E+10	-2.00E+02	-3.24E+03	1.162E+09	8.776E+00	-2.53E+08	4.46E+08	2.50E+08	4.00E+00	2.50E-01	3	4.30781E-01		
25	1.018E+06	1.21E+02	2.36E+03	1.156E+09	5.709E-01	2.13E+08	-3.85E+08	0.	4.25E+00	2.50E-01	1	5.56568E-05	3	2.79669E-02
26	1.102E+06	-3.90E+00	5.54E+02	2.096E+09	1.301E-03	0.	0.	0.	4.50E+00	2.50E-01	1	6.38440E-05		
27	1.015E+06	-2.35E-01	1.97E+02	2.045E+09	1.227E-03	0.	0.	0.	4.75E+00	2.50E-01	1	6.02171E-05		
28	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	5.00E+00	2.50E-01	1	6.01320E-05		

ENERGY MAP

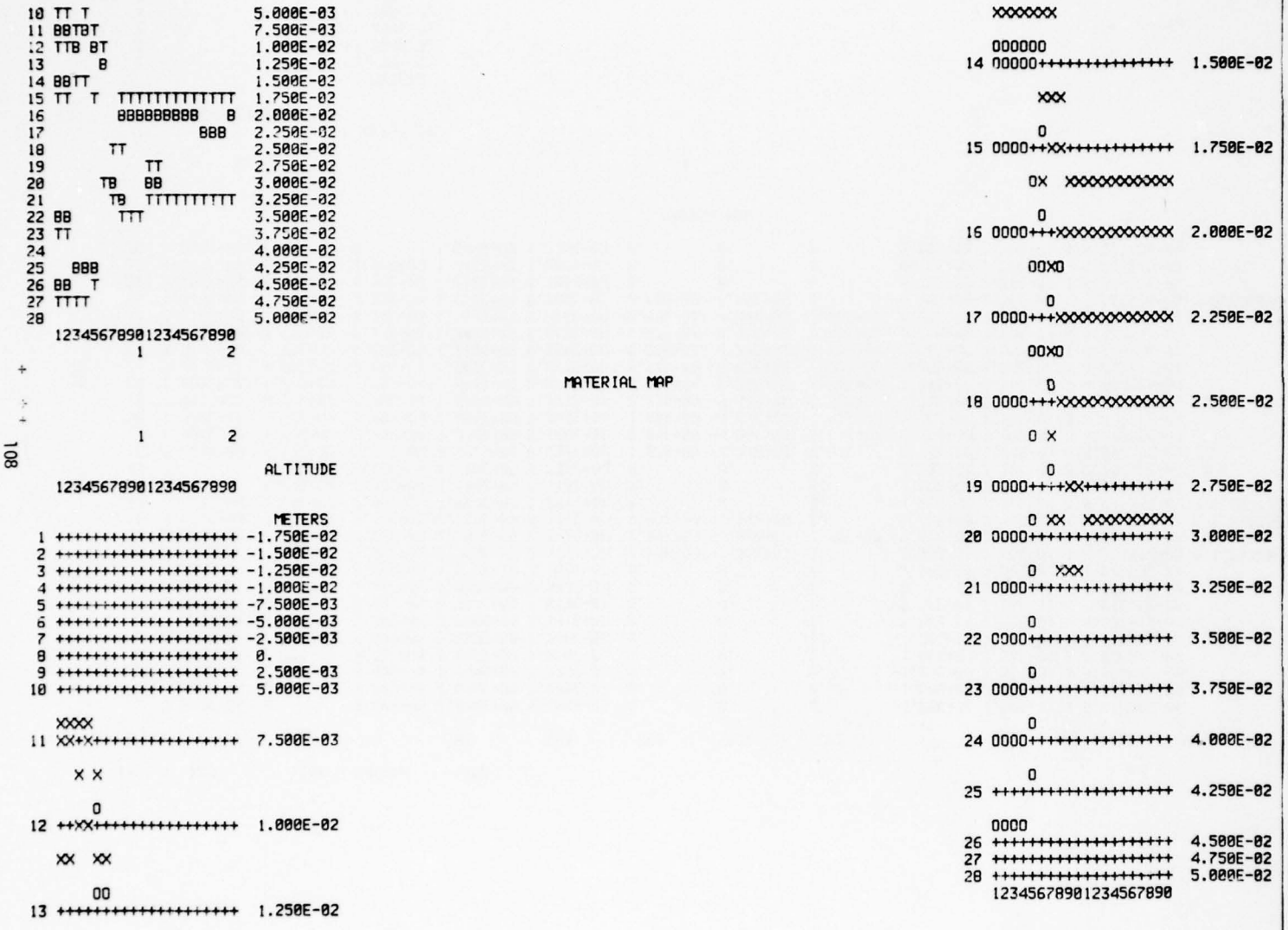
1 2

ALTITUDE

12345678901234567890

METERS

1	-1.750E-02
2	-1.500E-02
3	-1.250E-02
4	-1.000E-02
5	-7.500E-03
6	-5.000E-03
7	-2.500E-03
8	0.
9	2.500E-03

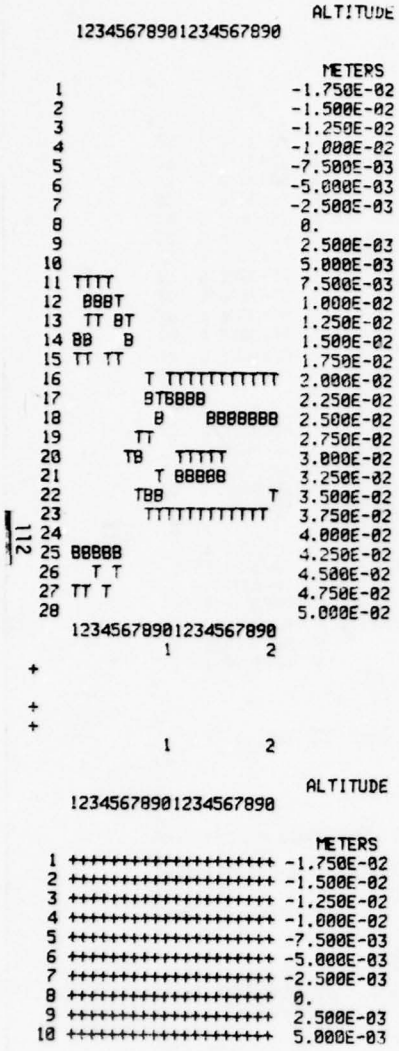

MATERIAL MAP
ALTITUDE
METERS
1234567890123456789
1 -1.750E-02
2 -1.500E-02
3 -1.250E-02
4 -1.000E-02
5 -7.500E-03
6 -5.000E-03
7 -2.500E-03
8 0.
9 2.500E-03
10 5.000E-03
11 7.500E-03
12 1.000E-02
13 1.250E-02
14 1.500E-02
15 1.750E-02
16 2.000E-02
17 2.250E-02
18 2.500E-02
19 2.750E-02
20 3.000E-02
21 3.250E-02
22 3.500E-02
23 3.750E-02
24 4.000E-02
25 4.250E-02
26 4.500E-02
27 4.750E-02
28 5.000E-02
1
2
108

```
                1         2
IN EOS, HIT NTRY LIMIT
IN EOS, J =  16 FORMING DPDTAU
IN EOS, J =  17 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
   CYCLE    70   TIME 9.1606E-06  DT 1.597E-07   IDT    8  JDT   19
IN EOS, J =  14 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  16 FORMING DPDTAU
IN EOS, J =  17 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
   CYCLE    71   TIME 9.3203E-06  DT 1.601E-07   IDT    8  JDT   19
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J =  14 FORMING DPDTAU
IN EOS, J =  15 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  16 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  16 FORMING DPDTAU
+
+
PRESSURE ITERATION
+
VOL =  7.368739823399011E-01
FIRST GUES  P =,  1.1718750000000000E-02
+
ITERATION NUMBER
+
     0          DELT P = -8.4555664934733 99E-03  P(N+1) =  3.263183506526601E-03
 MATERIAL       DELT V(I)                  V(I)                  P(I,N+1)          DP(I)/DTAU(I)
    2      3.552871630145589E-15  7.367886118920559E-01 -1.220703125000000E-03 -1.336349376349350E+13
    3     -1.579513451198062E-19  8.537044784761054E-05  0.                    -1.107327316349494E+13
   CYCLE    72   TIME 9.4804E-06  DT 1.605E-07   IDT    8  JDT   19
IN EOS, HIT NTRY LIMIT
IN EOS, J =  12 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  13 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  14 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J =  13 FORMING DPDTAU
IN EOS, J =  16 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
```

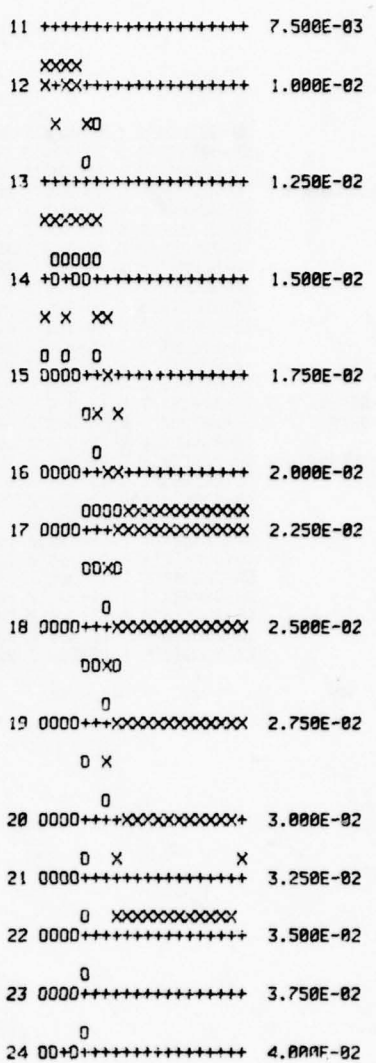
```
IN EOS, J =  17 FORMING DPDTAU
IN EOS, J =  16 FORMING DPDTAU
IN EOS, J =  16 FORMING DPDTAU
   CYCLE    73   TIME 9.5409E-06  DT 1.610E-07   IDT    8  JDT   19
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  14 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J =  16 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, J =  17 FORMING DPDTAU
IN EOS, J =  16 FORMING DPDTAU
IN EOS, J =  16 FORMING DPDTAU
   CYCLE    74   TIME 9.8019E-06  DT 1.090E-07   IDT    9  JDT   20
IN EOS, J =  14 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  14 FORMING DPDTAU
IN EOS, J =  16 FORMING DPDTAU
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  17 FORMING DPDTAU
IN EOS, J =  16 FORMING DPDTAU
IN EOS, J =  16 FORMING DPDTAU
IN EOS, J =  17 FORMING DPDTAU
   CYCLE    75   TIME 9.9108E-06  DT 8.916E-08   IDT    9  JDT   20
IN EOS, HIT NTRY LIMIT
IN EOS, HIT NTRY LIMIT
IN EOS, J =  14 FORMING DPDTAU
   CYCLE    76   TIME 1.0000E-05  DT 1.611E-07   IDT    9  JDT   20
+
+
**********
**********
+
PROB    1.2000     CYCLE    76     TIME  1.000000E-05     DT  1.611313E-07
+
+
+
     INTERNAL ENERGY          KINETIC ENERGY          TOTAL ENERGY              ETH                REL ERROR
   1.81444201725077E+12    2.40605361681851E+13    2.58749781854359E+13    2.58846162198399E+13   -2.00008516497821E+02
+
                                                        TOTAL MASS                MTH                RELMERR
                                                    6.68967744446800E+02    6.68967744446349E+02    7.61347669182575E-08
+
MAX VEL =  3.08026E+05 AT I  10 J  21
+
MAX CS =   5.58467E+05 AT I   1 J  15
+
MAX TEMP=  4.04622E+03 AT I   9 J  21
+
MAX P =   9.88407E+10 AT I   1 J  20
+
```

```
CELL SETTING DT, I   9 J  20
+
+
TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN, 27 SEC
                  OF THIS       0 HOURS,  0 MIN,  0 SEC IS 6600 TIME.
                     AND        0 HOURS,  0 MIN, 27 SEC IS 7600/176 TIME.
+
TIME FOR THIS RUN     0 HOURS,  0 MIN, 49 SEC
+
WHIZ FACTOR TOTAL PROBLEM   = 6.51E-04 SEC/CELL/CYCLE
+
WHIZ FACTOR SINCE LAST DUMP = 7.75E-04 SEC/CELL/CYCLE
+
+
+
+
I=   1  X(I)=      .250   DX(I)=      .250
+
 J       P         U         V         XI        RHO       SRR       SZZ       SRZ       Y        DY    M      XM     M      XM
+
  1  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03 0.        0.        0.       -1.75E+00 2.50E-01 1 6.01320E-05
  2  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03 0.        0.        0.       -1.50E+00 2.50E-01 1 6.01326E-05
  3  1.013E+06  9.77E-03  3.00E+05 2.044E+09 1.225E-03 0.        0.        0.       -1.25E+00 2.50E-01 1 6.01394E-05
  4  1.015E+06  9.02E-02  3.00E+05 2.045E+09 1.226E-03 0.        0.        0.       -1.00E+00 2.50E-01 1 6.02046E-05
  5  1.027E+06  5.61E-01  3.00E+05 2.053E+09 1.236E-03 0.        0.        0.       -7.50E-01 2.50E-01 1 6.06850E-05
  6  1.11ME+06  2.51E-01  2.98E+05 2.136E+09 1.286E-03 0.        0.        0.       -5.00E-01 2.50E-01 1 6.31241E-05
  7  1.638E+06 -9.58E+01  2.89E+05 2.793E+09 1.465E-03 0.        0.        0.       -2.50E-01 2.50E-01 1 7.18992E-05
  8  4.117E+06 -3.73E+02  2.62E+05 5.454E+09 1.952E-03 0.        0.        0.        0.       2.50E-01 1 9.58257E-05
  9  1.070E+07  4.56E+02  2.20E+05 9.728E+09 3.003E-03 0.        0.        0.        2.50E-01 2.50E-01 1 1.47402E-04
 10  1.286E+07  4.97E+03  1.59E+05 1.130E+10 3.161E-03 0.        0.        0.        5.00E-01 2.50E-01 1 1.55170E-04
 11  1.156E+07  4.75E+03  1.28E+05 8.389E+09 6.001E+00 9.83E+08 -1.81E+09 0.        7.50E-01 2.50E-01 1 2.77957E-05 2 2.94542E-01
 12 -5.028E+09  3.50E+03  1.15E+05 8.267E+09 7.427E+00 9.69E+08 -1.86E+09 1.79E+08  1.00E+00 2.50E-01 2 3.64565E-01
 13  3.320E+04  3.71E+03  1.13E+05 8.244E+09 9.175E-01 9.85E+08 -1.89E+09 0.        1.25E+00 2.50E-01 1 1.70680E-06 2 4.50347E-02
 14  8.211E+03  6.43E+03  7.79E+04 8.265E+09 4.465E+00 0.        0.        0.        1.50E+00 2.50E-01 3 2.19174E-01 2 4.32050E-06
 15  0.         6.45E+03  7.07E+04 7.806E+09 4.924E+00 0.        0.        0.        1.75E+00 2.50E-01 3 2.41709E-01
 16  0.         4.63E+02  4.42E+04 5.239E+09 8.120E+00 5.37E+07 -1.03E+08 -6.97E+06  2.00E+00 2.50E-01 3 3.98567E-01
 17  2.703E+10  3.28E+03  2.23E+04 3.047E+09 8.856E+00 2.35E+08 -4.91E+08  1.64E+07  2.25E+00 2.50E-01 3 4.34726E-01
 18  3.280E+10  2.82E+03  2.23E+04 2.043E+09 9.004E+00 2.47E+08 -4.88E+08 -1.39E+08  2.50E+00 2.50E-01 3 4.41980E-01
 19  7.329E+10  1.82E+03  2.28E+04 1.734E+09 9.282E+00 9.11E+07 -4.23E+08 -2.36E+08  2.75E+00 2.50E-01 3 4.55618E-01
 20  9.963E+10  6.28E+02  2.53E+04 1.665E+09 9.441E+00 9.08E+07 -4.50E+08 -1.90E+08  3.00E+00 2.50E-01 3 4.63458E-01
 21  8.386E+10 -7.36E+02  1.83E+04 1.496E+09 9.369E+00 2.10E+08 -5.17E+08 -7.00E+07  3.25E+00 2.50E-01 3 4.59907E-01
 22  3.638E+10 -1.20E+03  5.04E+03 1.277E+09 9.111E+00 2.78E+08 -5.29E+08  2.66E+07  3.50E+00 2.50E-01 3 4.47245E-01
 23  5.467E+09 -9.06E+02 -6.24E+03 1.190E+09 8.928E+00 3.00E+08 -4.95E+08  1.61E+08  3.75E+00 2.50E-01 3 4.38271E-01
 24 -3.374E+09 -4.54E+02 -1.27E+04 1.153E+09 8.876E+00 1.37E+08 -1.94E+08  4.28E+08  4.00E+00 2.50E-01 3 4.35713E-01
 25  1.019E+06  9.89E+01 -4.17E+03 1.205E+09 2.242E-01 2.13E+08 -3.85E+08  0.        4.25E+00 2.50E-01 1 5.50877E-05 3 1.09517E-02
 26  1.088E+06 -2.77E+01  6.83E+02 2.091E+09 1.287E-03 0.        0.        0.        4.50E+00 2.50E-01 1 6.31905E-05
 27  1.017E+06 -9.91E-01  3.35E+02 2.046E+09 1.228E-03 0.        0.        0.        4.75E+00 2.50E-01 1 6.02996E-05
 28  1.013E+06  0.        0.        2.044E+09 1.225E-03 0.        0.        0.        5.00E+00 2.50E-01 1 6.01320E-05
+

                                                                ENERGY MAP
+
+
           1         2
```



MATERIAL MAP



```
     0 0
 25 ++++++++++++++++++++  4.250E-02

    00 0
 26 ++++++++++++++++++++  4.500E-02
 27 ++++++++++++++++++++  4.750E-02
 28 ++++++++++++++++++++  5.000E-02
    12345678901234567890
              1         2
   CYCLE    77   TIME 1.0161E-05  DT 1.613E-07   IDT    9  JDT   20
   CYCLE    78   TIME 1.0322E-05  DT 1.615E-07   IDT    9  JDT   20
   CYCLE    79   TIME 1.0484E-05  DT 1.618E-07   IDT    9  JDT   20
   CYCLE    80   TIME 1.0646E-05  DT 1.611E-07   IDT    9  JDT   21
   CYCLE    81   TIME 1.0807E-05  DT 1.062E-07   IDT    9  JDT   21
   CYCLE    82   TIME 1.0913E-05  DT 8.692E-08   IDT    9  JDT   21
   CYCLE    83   TIME 1.1000E-05  DT 1.616E-07   IDT    9  JDT   21
+
+
**********
**********
+
PROB    1.2000     CYCLE    83     TIME  1.100000E-05     DT  1.615791E-07
+
+
+
     INTERNAL ENERGY          KINETIC ENERGY          TOTAL ENERGY              ETH                REL ERROR
   1.851402964049B5E+12    2.40086244858972E+13    2.58600274499470E+13    2.58705536595825E+13   -3.43443072307653E+01
+
                                                       TOTAL MASS                MTH                RELMERR
                                                   6.68657495281252E+02    6.68657495280771E+02    4.35257671709701E-08
+
MAX VEL =  3.06234E+05 AT I  10 J  22
+
MAX CS =   5.32705E+05 AT I   1 J  15
+
MAX TEMP=  4.05088E+03 AT I  10 J  22
+
MAX P =   1.11433E+11 AT I   1 J  22
+
CELL SETTING DT, I   9 J  21
+
+
TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN, 30 SEC
                  OF THIS       0 HOURS,  0 MIN,  6 SEC IS 6600 TIME.
                      AND       0 HOURS,  0 MIN, 30 SEC IS 7600/176 TIME.
+
TIME FOR THIS RUN     0 HOURS,  0 MIN, 52 SEC
+
WHIZ FACTOR TOTAL PROBLEM   = 6.63E-04 SEC/CELL/CYCLE
+
WHIZ FACTOR SINCE LAST DUMP = 7.89E-04 SEC/CELL/CYCLE
+
+
```

I= 1 X(I)= .250 DX(I)= .250

J	P	U	V	XI	RHO	SRR	SZZ	SRZ	Y	DY	M	XM	M	XM
1	1.013E+06	0.	3.00E-05	2.044E+09	1.225E-03	0.	0.	0.	-1.75E+00	2.50E-01	1	6.01320E-05		
2	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.50E+00	2.50E-01	1	6.01324E-05		
3	1.013E+06	4.72E-03	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.25E+00	2.50E-01	1	6.01362E-05		
4	1.014E+06	3.79E-02	3.00E+05	2.044E+09	1.226E-03	0.	0.	0.	-1.00E+00	2.50E-01	1	6.01704E-05		
5	1.020E+06	8.82E-02	3.00E+05	2.048E+09	1.231E-03	0.	0.	0.	-7.50E-01	2.50E-01	1	6.04226E-05		
6	1.061E+06	-2.09E+00	2.99E+05	2.083E+09	1.259E-03	0.	0.	0.	-5.00E-01	2.50E-01	1	6.17988E-05		
7	1.316E+06	-6.33E+01	2.94E+05	2.385E+09	1.370E-03	0.	0.	0.	-2.50E-01	2.50E-01	1	6.72513E-05		
8	2.678E+06	-4.06E+02	2.75E+05	4.013E+09	1.694E-03	0.	0.	0.	0.	2.50E-01	1	8.31476E-05		
9	7.256E+06	-4.63E+02	2.39E+05	7.865E+09	2.459E-03	0.	0.	0.	2.50E-01	2.50E-01	1	1.20727E-04		
10	1.406E+07	2.17E+03	1.91E+05	1.136E+10	3.437E-03	0.	0.	0.	5.00E-01	2.50E-01	1	1.68716E-04		
11	1.341E+07	5.05E+03	1.31E+05	8.373E+09	2.180E+00	9.82E+08	-1.81E+09	0.	7.50E-01	2.50E-01	1	1.13404E-04	2	1.06887E-01
12	-1.735E+10	1.60E+03	1.20E+05	8.387E+09	7.319E+00	1.09E+09	-1.78E+09	2.29E+08	1.00E+00	2.50E-01	2	3.59281E-01		
13	3.563E+04	1.92E+03	1.14E+05	8.318E+09	4.316E+00	1.18E+09	-1.82E+09	0.	1.25E+00	2.50E-01	1	8.79176E-07	2	2.11854E-01
14	1.993E+04	6.43E+03	7.84E+04	8.271E+09	1.465E+00	0.	0.	0.	1.50E+00	2.50E-01	3	7.19020E-02	2	4.31969E-06
15	0.	5.21E+03	6.67E+04	8.205E+09	5.723E+00	0.	0.	0.	1.75E+00	2.50E-01	3	2.80924E-01		
16	0.	5.73E+02	4.46E+04	5.778E+09	8.155E+00	0.	0.	0.	2.00E+00	2.50E-01	3	4.00319E-01		
17	6.160E+09	2.94E+03	2.58E+04	3.378E+09	8.694E+00	2.36E+08	-4.81E+08	2.53E+07	2.25E+00	2.50E-01	3	4.26781E-01		
18	-9.724E+09	3.23E+03	1.81E+04	2.141E+09	8.728E+00	2.73E+08	-5.09E+08	1.05E+07	2.50E+00	2.50E-01	3	4.28457E-01		
19	-5.504E+09	3.02E+03	1.01E+04	1.584E+09	8.815E+00	2.89E+08	-5.22E+08	1.00E+06	2.75E+00	2.50E-01	3	4.32691E-01		
20	2.425E+10	3.15E+03	1.08E+04	1.433E+09	9.019E+00	2.36E+08	-5.20E+08	-7.10E+07	3.00E+00	2.50E-01	3	4.42725E-01		
21	7.577E+10	2.56E+03	1.48E+04	1.527E+09	9.319E+00	1.16E+08	-4.72E+08	-1.60E+08	3.25E+00	2.50E-01	3	4.57437E-01		
22	1.095E+11	1.66E+03	1.57E+04	1.635E+09	9.500E+00	1.48E+08	-4.97E+08	-1.03E+08	3.50E+00	2.50E-01	3	4.66351E-01		
23	9.304E+10	5.23E+02	1.03E+04	1.483E+09	9.423E+00	1.97E+08	-5.18E+08	-5.16E+07	3.75E+00	2.50E-01	3	4.62567E-01		
24	2.871E+10	-1.32E+02	2.14E+03	1.226E+09	9.070E+00	3.34E+08	-5.25E+08	-4.99E+05	4.00E+00	2.50E-01	3	4.45213E-01		
25	9.844E+05	-9.84E+01	1.97E+03	1.358E+09	7.824E-03	2.86E+08	-4.48E+08	0.	4.25E+00	2.50E-01	1	5.61520E-05	3	3.27904E-04
26	1.069E+06	-6.61E+01	7.31E+02	2.079E+09	1.271E-03	0.	0.	0.	4.50E+00	2.50E-01	1	6.24061E-05		
27	1.019E+06	-2.58E+00	4.38E+02	2.048E+09	1.230E-03	0.	0.	0.	4.75E+00	2.50E-01	1	6.03911E-05		
28	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	5.00E+00	2.50E-01	1	6.01320E-05		

ENERGY MAP

1 2

ALTITUDE

12345678901234567890

METERS

1	-1.750E-02
2	-1.500E-02
3	-1.250E-02
4	-1.000E-02
5	-7.500E-03
6	-5.000E-03
7	-2.500E-03
8	0.
9	2.500E-03
10	5.000E-03

```
11 TT T                    7.500E-03
12 BBTBT                   1.000E-02
13 T   BT                  1.250E-02
14  T   B                  1.500E-02
15    TT  T                1.750E-02
16        BT               2.000E-02
17        TBTTT            2.250E-02
18        BT B TTTTTTTT    2.500E-02
19        T B BBBBBBBBB    2.750E-02
20       T B               3.000E-02
21 BB    B T TTTTT         3.250E-02
22   B B     BBBBB         3.500E-02
23 TTT  TTBB               3.750E-02
24        T TTTTTTTTTT     4.000E-02
25 B BBT   T               4.250E-02
26  B                      4.500E-02
27 TTTT                    4.750E-02
28                         5.000E-02
   12345678901234567890
            1         2
+
+
+
            1         2

                          ALTITUDE
   12345678901234567890

                          METERS
 1 ++++++++++++++++++++ -1.750E-02
 2 ++++++++++++++++++++ -1.500E-02
 3 ++++++++++++++++++++ -1.250E-02
 4 ++++++++++++++++++++ -1.000E-02
 5 ++++++++++++++++++++ -7.500E-03
 6 ++++++++++++++++++++ -5.000E-03
 7 ++++++++++++++++++++ -2.500E-03
 8 ++++++++++++++++++++  0.
 9 ++++++++++++++++++++  2.500E-03
10 ++++++++++++++++++++  5.000E-03
11 ++++++++++++++++++++  7.500E-03

   XXXX
12 XX+X++++++++++++++++  1.000E-02

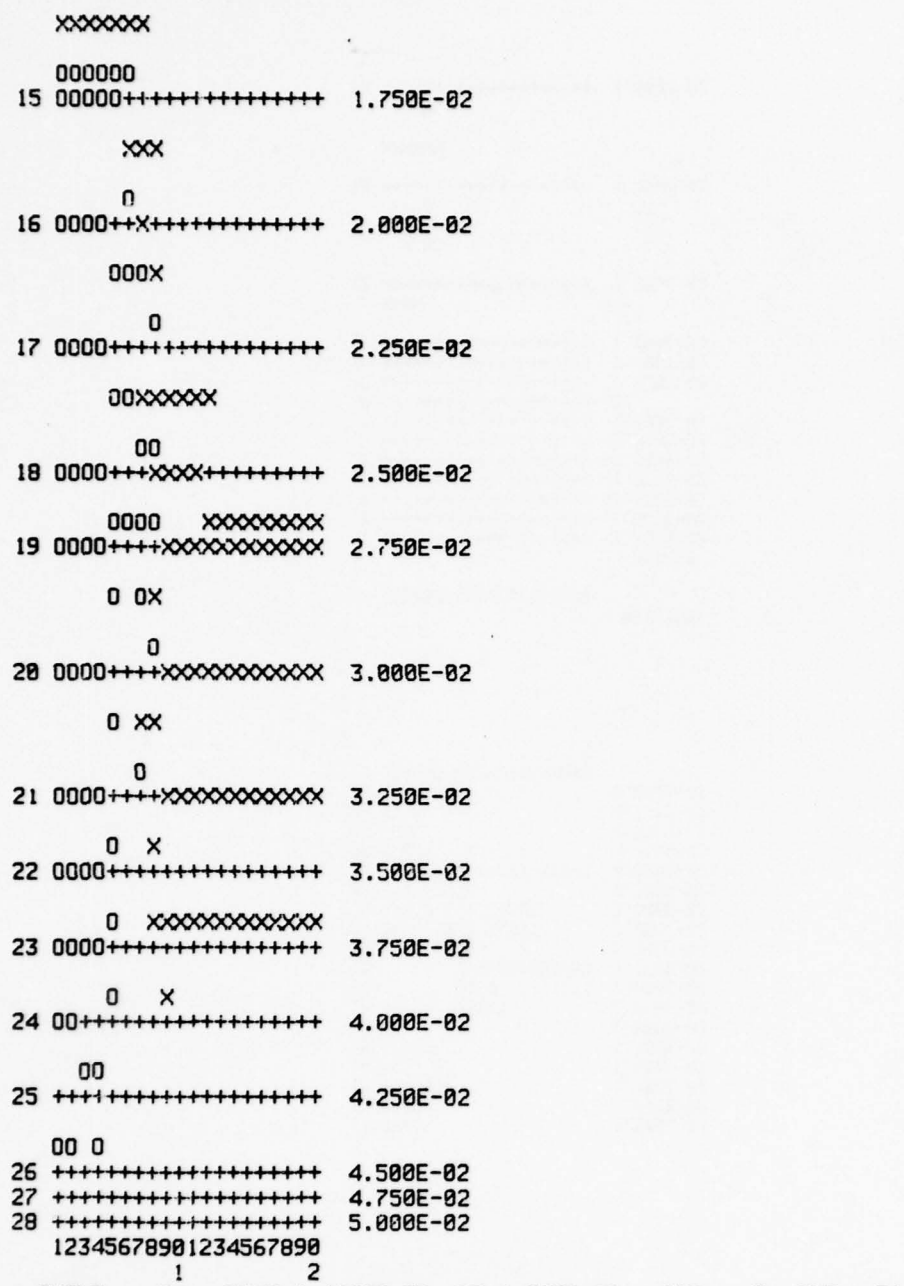
    X XO

     O
13 ++++++++++++++++++++  1.250E-02

   XXXXXX

     OO
14 ++++++++++++++++++++  1.500E-02
```

MATERIAL MAP



CYCLE 84 TIME 1.1162E-05 DT 1.617E-07 IDT 9 JDT 21
CYCLE 65 TIME 1.1323E-05 DT 1.613E-07 IDT 9 JDT 22

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   CYCLE    86   TIME 1.1485E-05  DT 1.614E-07   IDT    9  JDT   22
   CYCLE    87   TIME 1.1646E-05  DT 1.615E-07   IDT    9  JDT   22
   CYCLE    88   TIME 1.1807E-05  DT 1.059E-07   IDT    9  JDT   22
   CYCLE    89   TIME 1.1913E-05  DT 8.666E-08   IDT    9  JDT   22
   CYCLE    90   TIME 1.2000E-05  DT 1.619E-07   IDT    9  JDT   22
+
+
**********
**********
+
PROB    1.2000     CYCLE    90     TIME  1.200000E-05     DT  1.619256E-07
+
+
+
     INTERNAL ENERGY          KINETIC ENERGY          TOTAL ENERGY              ETH                  REL ERROR
   1.882483479569 63E+12    2.396238228105 20E+13    2.584486576062 16E+13    2.585572999001 77E+13    -1.307862625101 77E+01
+
                                                      TOTAL MASS                MTH                  RELMERR
                                                    6.683258480436 49E+02    6.683258480431 32E+02    5.443420777067 46E-08
+
MAX VEL =  3.04642E+05 AT I  10 J  23
+
MAX CS =   4.94449E+05 AT I   2 J  15
+
MAX TEMP=  4.08374E+03 AT I   9 J  23
+
MAX P =   3.87511E+10 AT I   1 J  23
+
CELL SETTING DT, I   9 J  22
+
+
TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN, 34 SEC
                  OF THIS       0 HOURS,  0 MIN,  0 SEC IS 6600 TIME.
                     AND        0 HOURS,  0 MIN, 34 SEC IS 7600/176 TIME.
+
TIME FOR THIS RUN     0 HOURS,  0 MIN, 56 SEC
+
WHIZ FACTOR TOTAL PROBLEM   = 6.76E-04 SEC/CELL/CYCLE
+
WHIZ FACTOR SINCE LAST DUMP = 8.38E-04 SEC/CELL/CYCLE
+
+
+
+
I=   1  X(I)=      .250   DX(I)=     .250
+
 J       P         U         V         XI        RHO       SRR       SZZ       SRZ        Y        DY    M      XM      M      XM
+
  1  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.75E+00 2.50E-01 1 6.01320E-05
  2  1.013E+06  0.        3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.50E+00 2.50E-01 1 6.01323E-05
  3  1.013E+06  1.98E-03  3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.25E+00 2.50E-01 1 6.01343E-05
  4  1.013E+06  1.23E-02  3.00E+05 2.044E+09 1.225E-03  0.        0.        0.       -1.00E+00 2.50E-01 1 6.01521E-05
  5  1.017E+06 -6.32E-02  3.00E+05 2.046E+09 1.228E-03  0.        0.        0.       -7.50E-01 2.50E-01 1 6.02814E-05
  6  1.037E+06 -2.14E+00  2.99E+05 2.061E+09 1.243E-03  0.        0.        0.       -5.00E-01 2.50E-01 1 6.10300E-05
```
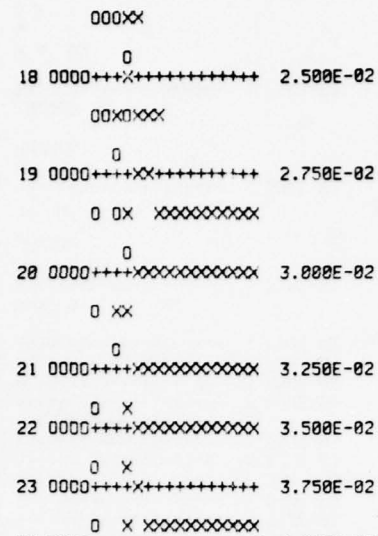

7	1.159E+06	-3.79E+01	2.97E+05	2.192E+09	1.310E-03	0.	0.	0.	-2.50E-01	2.50E-01	1	6.42907E-05	
8	1.861E+06	-3.04E+02	2.85E+05	3.062E+09	1.523E-03	0.	0.	0.	0.	2.50E-01	1	7.47711E-05	
9	4.750E+06	-8.09E+02	2.56E+05	6.014E+09	2.058E-03	0.	0.	0.	2.50E-01	2.50E-01	1	1.01005E-04	
10	1.200E+07	4.29E+02	2.12E+05	1.035E+10	3.187E-03	0.	0.	0.	5.00E-01	2.50E-01	1	1.56442E-04	
11	1.524E+07	3.88E+03	1.56E+05	1.196E+10	3.560E-03	0.	0.	0.	7.50E-01	2.50E-01	1	1.74772E-04	
12	1.357E+07	4.52E+03	1.26E+05	8.448E+09	5.732E+00	1.04E+09	-1.77E+09	0.	1.00E+00	2.50E-01	1	3.66324E-05	2 2.81330E-01
13	-4.818E+07	2.96E+03	1.17E+05	8.387E+09	7.459E+00	1.11E+09	-1.80E+09	0.	1.25E+00	2.50E-01	2	3.66153E-01	
14	2.700E+04	2.90E+03	1.16E+05	8.382E+09	2.652E-01	1.12E+09	-1.80E+09	0.	1.50E+00	2.50E-01	1	1.51242E-06	2 1.30161E-02
15	7.259E+03	4.63E+03	6.51E+04	8.343E+09	5.150E+00	0.	0.	0.	1.75E+00	2.50E-01	3	2.52820E-01	1 1.57249E-07
16	0.	8.56E+02	4.63E+04	6.286E+09	8.326E+00	0.	0.	0.	2.00E+00	2.50E-01	3	4.08721E-01	
17	5.411E+09	2.39E+03	3.16E+04	3.781E+09	8.648E+00	2.05E+08	-4.15E+08	2.47E+06	2.25E+00	2.50E-01	3	4.24531E-01	
18	-6.618E+06	1.98E+03	2.34E+04	2.311E+09	8.770E+00	2.51E+08	-5.06E+08	-8.33E+06	2.50E+00	2.50E-01	3	4.30480E-01	
19	-1.708E+10	1.95E+03	1.13E+04	1.682E+09	8.732E+00	2.72E+08	-5.20E+08	2.07E+07	2.75E+00	2.50E-01	3	4.28651E-01	
20	-2.967E+10	2.54E+03	1.62E+03	1.456E+09	8.680E+00	2.89E+08	-5.20E+08	6.03E+07	3.00E+00	2.50E-01	3	4.26063E-01	
21	-2.466E+10	2.85E+03	-4.05E+02	1.349E+09	8.722E+00	3.05E+08	-5.15E+08	8.89E+07	3.25E+00	2.50E-01	3	4.28122E-01	
22	-6.998E+09	2.94E+03	5.44E+03	1.304E+09	8.836E+00	-4.30E+08	3.94E+08	-1.99E+08	3.50E+00	2.50E-01	3	4.33752E-01	
23	1.995E+10	2.69E+03	1.75E+04	1.275E+09	9.010E+00	-3.26E+08	2.61E+08	-3.49E+08	3.75E+00	2.50E-01	3	4.42279E-01	
24	9.172E+09	7.11E+02	2.42E+04	1.240E+09	8.946E+00	8.13E+07	-5.95E+07	-4.54E+08	4.00E+00	2.50E-01	3	4.39146E-01	
25	1.006E+06	5.03E+02	2.20E+04	1.262E+09	6.096E-01	3.48E+08	-4.41E+08	0.	4.25E+00	2.50E-01	1	5.26300E-05	3 2.98688E-02
26	1.140E+06	-8.31E+01	1.57E+03	2.124E+09	1.328E-03	0.	0.	0.	4.50E+00	2.50E-01	1	6.51881E-05	
27	1.022E+06	-5.32E+00	5.59E+02	2.049E+09	1.233E-03	0.	0.	0.	4.75E+00	2.50E-01	1	6.05135E-05	
28	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	5.00E+00	2.50E-01	1	6.01320E-05	

ENERGY MAP

```
                1         2

                          ALTITUDE
    12345678901234567890

                            METERS
 1                       -1.750E-02
 2                       -1.500E-02
 3                       -1.250E-02
 4                       -1.000E-02
 5                       -7.500E-03
 6                       -5.000E-03
 7                       -2.500E-03
 8                        0.
 9                        2.500E-03
10                        5.000E-03
11                        7.500E-03
12 TTTT                   1.000E-02
13  B BT                  1.250E-02
14  TB BT                 1.500E-02
15   TT B                 1.750E-02
16     T                  2.000E-02
17        TT              2.250E-02
18         BT             2.500E-02
19        BT TTTTTTTTT    2.750E-02
20       TT  BBBBBBBBB    3.000E-02
21       B                3.250E-02
22          B TTTT        3.500E-02
```

```
23            BBBB        3.750E-02
24   BBBTTBB              4.000E-02
25 BB TT  T TTTTTTTTTT    4.250E-02
26   B    T               4.500E-02
27 TTTT                   4.750E-02
28                        5.000E-02
   12345678901234567890
             1         2
÷
                                          MATERIAL MAP
+
÷
             1         2

                                 ALTITUDE
   12345678901234567890

                                  METERS
 1 ++++++++++++++++++++ -1.750E-02
 2 ++++++++++++++++++++ -1.500E-02
 3 ++++++++++++++++++++ -1.250E-02
 4 ++++++++++++++++++++ -1.000E-02
 5 ++++++++++++++++++++ -7.500E-03
 6 ++++++++++++++++++++ -5.000E-03
 7 ++++++++++++++++++++ -2.500E-03
 8 ++++++++++++++++++++  0.
 9 ++++++++++++++++++++  2.500E-03
10 ++++++++++++++++++++  5.000E-03
11 ++++++++++++++++++++  7.500E-03
12 ++++++++++++++++++++  1.000E-02

   XXXX O
13 X+++++++++++++++++++  1.250E-02

    XXXXO

      O
14 ++++++++++++++++++++  1.500E-02

   XXXXXX

    OOOOO
15 +O+OOX++++++++++++++  1.750E-02

   X X  OX

   O O
16 OOOO++X++++++++++++++  2.000E-02

       OXOX

       O
17 OOOO++X++++++++++++++  2.250E-02
```



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18 2.500E-02
19 2.750E-02
20 3.000E-02
21 3.250E-02
22 3.500E-02
23 3.750E-02
24 4.000E-02
25 4.250E-02
26 4.500E-02
27 4.750E-02
28 5.000E-02
   12345678901234567890
            1         2
  CYCLE    91   TIME 1.2162E-05  DT 1.615E-07   IDT    9  JDT   23
  CYCLE    92   TIME 1.2323E-05  DT 1.616E-07   IDT    9  JDT   23
  CYCLE    93   TIME 1.2485E-05  DT 1.617E-07   IDT    9  JDT   23
  CYCLE    94   TIME 1.2647E-05  DT 1.619E-07   IDT    9  JDT   23
  CYCLE    95   TIME 1.2809E-05  DT 1.053E-07   IDT    9  JDT   23
  CYCLE    96   TIME 1.2914E-05  DT 8.612E-08   IDT    9  JDT   23
  CYCLE    97   TIME 1.3000E-05  DT 1.623E-07   IDT    9  JDT   23
+
+
**********
**********
+
PROB    1.2000     CYCLE    97     TIME  1.300000E-05     DT  1.623101E-07
+
+
+
```

INTERNAL ENERGY	KINETIC ENERGY	TOTAL ENERGY	ETH	REL ERROR
1.912188385807 35E+12	2.391523022217 30E+13	2.582741860798 02E+13	2.583995867972 80E+13	-6.488196304549 55E+01

TOTAL MASS	MTH	RELMERR
6.679737692913 08E+02	6.679737692907 66E+02	3.812402944603 92E-08

MAX VEL = 3.03855E+05 AT I 11 J 24

MAX CS = 4.95512E+05 AT I 1 J 13

MAX TEMP= 4.07229E+03 AT I 10 J 25

MAX P = 3.02835E+10 AT I 1 J 16

CELL SETTING DT, I 9 J 23

TOTAL TIME FOR THIS PROBLEM 0 HOURS, 0 MIN, 37 SEC
OF THIS 0 HOURS, 0 MIN, 0 SEC IS 6600 TIME.
AND 0 HOURS, 0 MIN, 37 SEC IS 7600/176 TIME.

TIME FOR THIS RUN 0 HOURS, 0 MIN, 59 SEC

WHIZ FACTOR TOTAL PROBLEM = 6.88E-04 SEC/CELL/CYCLE

WHIZ FACTOR SINCE LAST DUMP = 8.26E-04 SEC/CELL/CYCLE

I= 1 X(I)= .250 DX(I)= .250

J	P	U	V	XI	RHO	SRR	SZZ	SRZ	Y	DY	M	XM	M	XM
1	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.75E+00	2.50E-01	1	6.01320E-05		
2	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.50E+00	2.50E-01	1	6.01322E-05		
3	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.25E+00	2.50E-01	1	6.01333E-05		
4	1.013E+06	1.23E-03	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.00E+00	2.50E-01	1	6.01424E-05		
5	1.015E+06	-8.76E-02	3.00E+05	2.045E+09	1.227E-03	0.	0.	0.	-7.50E-01	2.50E-01	1	6.02078E-05		
6	1.025E+06	-1.59E+00	3.00E+05	2.052E+09	1.235E-03	0.	0.	0.	-5.00E-01	2.50E-01	1	6.06020E-05		
7	1.084E+06	-2.13E+01	2.98E+05	2.107E+09	1.273E-03	0.	0.	0.	-2.50E-01	2.50E-01	1	6.24721E-05		
8	1.431E+06	-1.89E+02	2.92E+05	2.526E+09	1.409E-03	0.	0.	0.	0.	2.50E-01	1	6.91817E-05		
9	3.112E+06	-7.67E+02	2.70E+05	4.462E+09	1.780E-03	0.	0.	0.	2.50E-01	2.50E-01	1	8.73916E-05		
10	8.336E+06	-7.97E+02	2.31E+05	8.557E+09	2.620E-03	0.	0.	0.	5.00E-01	2.50E-01	1	1.28593E-04		
11	1.627E+07	1.68E+03	1.84E+05	1.204E+10	3.778E-03	0.	0.	0.	7.50E-01	2.50E-01	1	1.85435E-04		
12	1.541E+07	5.24E+03	1.26E+05	8.452E+09	1.966E+00	1.04E+09	-1.77E+09	0.	1.00E+00	2.50E-01	1	1.29101E-04	2	9.63732E-02
13	-8.159E+09	1.73E+03	1.20E+05	8.439E+09	7.389E+00	1.02E+09	-1.68E+09	4.86E+08	1.25E+00	2.50E-01	2	3.62701E-01		
14	3.125E+04	1.81E+03	1.17E+05	8.424E+09	3.758E+00	1.08E+09	-1.78E+09	0.	1.50E+00	2.50E-01	1	8.97302E-07	2	1.84455E-01
15	1.846E+04	4.63E+03	6.00E+04	8.425E+09	2.875E+00	0.	0.	0.	1.75E+00	2.50E-01	3	1.41137E-01	1	6.90566E-07
16	2.879E+10	4.50E+03	4.43E+04	6.712E+09	8.496E+00	0.	0.	0.	2.00E+00	2.50E-01	3	4.17035E-01		
17	3.746E+09	2.46E+03	3.68E+04	4.241E+09	8.593E+00	1.68E+08	-3.13E+08	-4.57E+07	2.25E+00	2.50E-01	3	4.21789E-01		
18	1.002E+10	1.91E+03	2.71E+04	2.516E+09	8.809E+00	2.38E+08	-5.01E+08	-2.88E+07	2.50E+00	2.50E-01	3	4.32416E-01		
19	-2.730E+08	1.49E+03	2.01E+04	1.754E+09	8.829E+00	2.52E+08	-5.18E+08	-2.43E+07	2.75E+00	2.50E-01	3	4.33374E-01		
20	-2.265E+10	8.84E+02	1.19E+04	1.491E+09	8.719E+00	2.64E+08	-5.25E+08	2.32E+06	3.00E+00	2.50E-01	3	4.27981E-01		

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21 -5.944E+10  9.82E+02  6.37E+03 1.505E+09 8.497E+00  3.04E+08 -5.22E+08  1.29E+07  3.25E+00 2.50E-01 3 4.17105E-01
22 -8.694E+10  6.89E+02  3.24E+03 1.603E+09 8.330E+00  3.36E+08  1.10E+08  2.07E+08  3.50E+00 2.50E-01 3 4.00886E-01
23 -8.057E+10  1.48E+03  7.05E+03 1.541E+09 8.372E+00 -1.34E+08  5.02E+08 -5.41E+07  3.75E+00 2.50E-01 3 4.10947E-01
24 -3.072E+10  2.10E+02  1.32E+04 1.301E+09 8.690E+00 -2.66E+08  5.03E+08 -1.43E+08  4.00E+00 2.50E-01 3 4.26553E-01
25  9.945E+05  6.49E+02  1.79E+04 1.267E+09 1.326E+00 -1.14E+08  3.80E+08  0.        4.25E+00 2.50E-01 1 4.71350E-05 3 6.50533E-02
26  1.268E+06 -3.11E+01  3.24E+03 2.207E+09 1.414E-03  0.        0.        0.        4.50E+00 2.50E-01 1 6.94274E-05
27  1.030E+06 -8.08E+00  8.52E+02 2.055E+09 1.240E-03  0.        0.        0.        4.75E+00 2.50E-01 1 6.08537E-05
28  1.013E+06  0.        0.       2.044E+09 1.225E-03  0.        0.        0.        5.00E+00 2.50E-01 1 6.01320E-05
+
```

ENERGY MAP

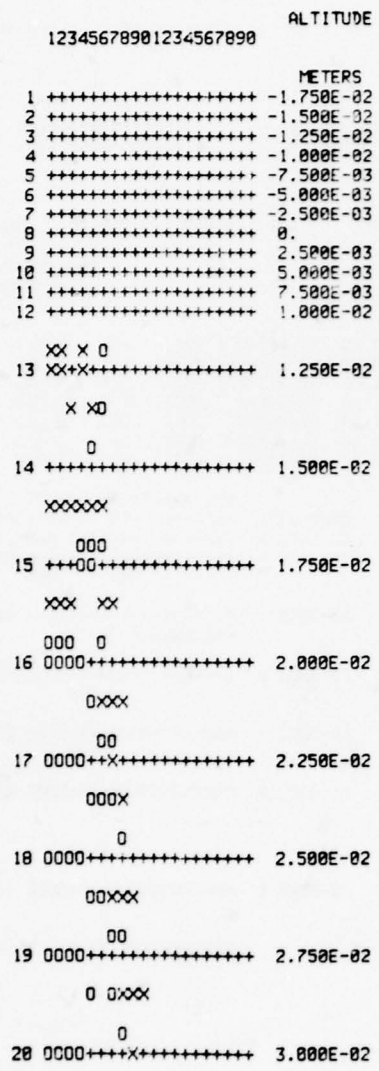
```
+
+
          1         2

                    ALTITUDE
   12345678901234567890

                     METERS
 1                  -1.750E-02
 2                  -1.500E-02
 3                  -1.250E-02
 4                  -1.000E-02
 5                  -7.500E-03
 6                  -5.000E-03
 7                  -2.500E-03
 8                   0.
 9                   2.500E-03
10                   5.000E-03
11                   7.500E-03
12 TT T              1.000E-02
13  BTBT             1.250E-02
14   B BT            1.500E-02
15 BTT  BT           1.750E-02
16 T  TT B           2.000E-02
17         T         2.250E-02
18        TB         2.500E-02
19        BT         2.750E-02
20        T TTTTTTTTTT 3.000E-02
21 B     T    BBBBBBBBB 3.250E-02
22  B    B   B        3.500E-02
23 TT        TTTTT    3.750E-02
24   BBB      BBBB    4.000E-02
25   TT TTB BB        4.250E-02
26 BBBBT  TB TTTTTTTTTT 4.500E-02
27 TTTT    TT         4.750E-02
28                    5.000E-02
   12345678901234567890
          1         2
+
```

MATERIAL MAP

```
+
+
          1         2
```


ALTITUDE
12345678901234567890
METERS
1 -1.750E-02
2 -1.500E-02
3 -1.250E-02
4 -1.000E-02
5 -7.500E-03
6 -5.000E-03
7 -2.500E-03
8 0.
9 2.500E-03
10 5.000E-03
11 7.500E-03
12 1.000E-02
13 1.250E-02
14 1.500E-02
15 1.750E-02
16 2.000E-02
17 2.250E-02
18 2.500E-02
19 2.750E-02
20 3.000E-02

```
       0 0X XXXXXXXXXX

         0
21 0000++++XXXXXXXXXX  3.250E-02

       0 XX

         0
22 0000++++XXXXXXXXXX  3.500E-02

       0  X
23 0000++++XXXXXXXXXX  3.750E-02

       0  X
24 0000++++XX++++++++  4.000E-02

       0  X  XXXXXXXXX
25 ++++++++++++++++++  4.250E-02

   0000    XX
26 ++++++++++++++++++  4.500E-02
27 ++++++++++++++++++  4.750E-02
28 ++++++++++++++++++  5.000E-02
   12345678901234567890
            1         2
  CYCLE    98   TIME 1.3162E-05  DT 1.619E-07   IDT    9  JDT   24
  CYCLE    99   TIME 1.3324E-05  DT 1.620E-07   IDT    9  JDT   24
  CYCLE   100   TIME 1.3486E-05  DT 1.621E-07   IDT    9  JDT   24
  CYCLE   101   TIME 1.3648E-05  DT 1.623E-07   IDT    9  JDT   24
  CYCLE   102   TIME 1.3811E-05  DT 1.041E-07   IDT    9  JDT   24
  CYCLE   103   TIME 1.3915E-05  DT 8.521E-08   IDT    9  JDT   24
  CYCLE   104   TIME 1.4000E-05  DT 1.628E-07   IDT    9  JDT   24
+
+
**********
**********
+
PROB    1.2000     CYCLE   104     TIME  1.400000E-05     DT  1.627629E-07
+
+
+
    INTERNAL ENERGY          KINETIC ENERGY          TOTAL ENERGY              ETH                REL ERROR
  1.93429039513241E+12   2.38689782361200E+13   2.580326863125 24E+13   2.58190775151343E+13   -1.26666048914780E+02
+
                                                  TOTAL MASS                MTH                RELMERR
                                                 6.67564304070136E+02   6.67564304069623E+02   -4.35970441787965E-08
+
MAX VEL =  3.09752E+05 AT I  10 J  27
+
MAX CS =   4.80672E+05 AT I   9 J  21
+
MAX TEMP=   4.07281E+03 AT I  11 J  26
+
```

MAX P = 2.62828E+10 AT I 3 J 16

+

CELL SETTING DT, I 9 J 24

+

+

TOTAL TIME FOR THIS PROBLEM 0 HOURS, 0 MIN, 40 SEC

OF THIS 0 HOURS, 0 MIN, 0 SEC IS 6600 TIME.

AND 0 HOURS, 0 MIN, 40 SEC IS 7600/176 TIME.

+

TIME FOR THIS RUN 0 HOURS, 1 MIN, 2 SEC

+

WHIZ FACTOR TOTAL PROBLEM = 6.91E-04 SEC/CELL/CYCLE

+

WHIZ FACTOR SINCE LAST DUMP = 7.34E-04 SEC/CELL/CYCLE

+

+

+

+

I= 1 X(I)= .250 DX(I)= .250

+

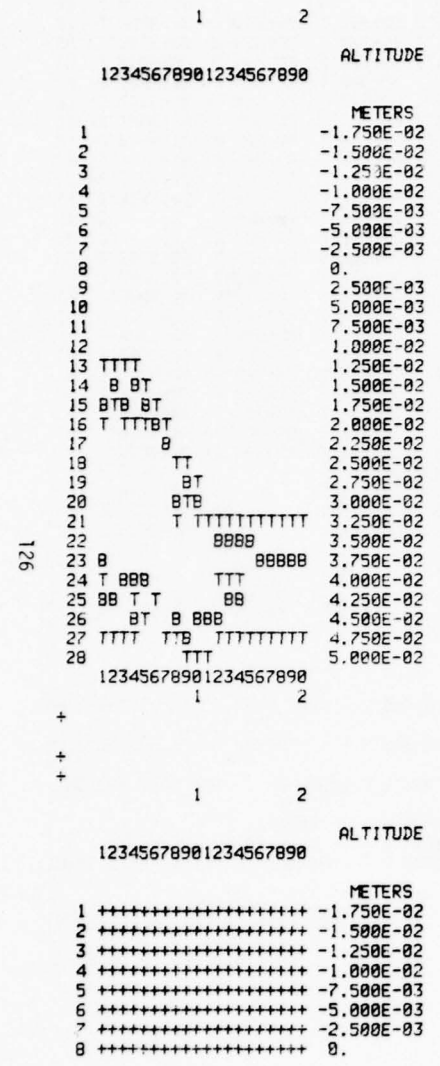
J	P	U	V	XI	RHO	SRR	SZZ	SRZ	Y	DY	M	XM	M	XM
1	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.75E+00	2.50E-01	1	6.01320E-05		
2	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.50E+00	2.50E-01	1	6.01321E-05		
3	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.25E+00	2.50E-01	1	6.01327E-05		
4	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.00E+00	2.50E-01	1	6.01374E-05		
5	1.014E+06	-7.06E-02	3.00E+05	2.045E+09	1.226E-03	0.	0.	0.	-7.50E-01	2.50E-01	1	6.01702E-05		
6	1.019E+06	-1.03E+00	3.00E+05	2.048E+09	1.230E-03	0.	0.	0.	-5.00E-01	2.50E-01	1	6.03725E-05		
7	1.048E+06	-1.16E+01	2.99E+05	2.072E+09	1.251E-03	0.	0.	0.	-2.50E-01	2.50E-01	1	6.14042E-05		
8	1.216E+06	-1.06E+02	2.96E+05	2.259E+09	1.335E-03	0.	0.	0.	0.	2.50E-01	1	6.55142E-05		
9	2.122E+06	-5.67E+02	2.82E+05	3.362E+09	1.568E-03	0.	0.	0.	2.50E-01	2.50E-01	1	7.79512E-05		
10	5.592E+06	-1.24E+03	2.49E+05	6.699E+09	2.194E-03	0.	0.	0.	5.00E-01	2.50E-01	1	1.07716E-04		
11	1.487E+07	1.34E+02	2.03E+05	1.118E+10	3.489E-03	0.	0.	0.	7.50E-01	2.50E-01	1	1.71247E-04		
12	1.734E+07	4.11E+03	1.48E+05	1.266E+10	3.854E-03	0.	0.	0.	1.00E+00	2.50E-01	1	1.89191E-04		
13	1.574E+07	4.01E+03	1.23E+05	8.470E+09	5.628E+00	9.54E+08	-1.77E+09	0.	1.25E+00	2.50E-01	1	4.29103E-05	2	2.76233E-01
14	3.867E+04	2.83E+03	1.19E+05	8.450E+09	7.263E+00	1.03E+09	-1.77E+09	0.	1.50E+00	2.50E-01	1	5.78334E-08	2	3.56540E-01
15	2.882E+04	4.63E+03	5.55E+04	8.489E+09	1.004E+00	0.	0.	0.	1.75E+00	2.50E-01	3	4.92835E-02	1	1.45404E-06
16	0.	2.59E+03	4.35E+04	6.997E+09	8.269E+00	0.	0.	0.	2.00E+00	2.50E-01	3	4.05906E-01		
17	0.	2.65E+03	3.83E+04	4.679E+09	8.442E+00	1.10E+08	-2.20E+08	-6.81E+06	2.25E+00	2.50E-01	3	4.14402E-01		
18	-3.324E+09	2.82E+03	3.00E+04	2.777E+09	8.700E+00	2.38E+08	-4.93E+08	-3.92E+07	2.50E+00	2.50E-01	3	4.27054E-01		
19	-1.137E+10	1.64E+03	2.58E+04	1.859E+09	8.749E+00	2.55E+08	-4.96E+08	-1.26E+08	2.75E+00	2.50E-01	3	4.29441E-01		
20	-1.273E+10	2.97E+02	2.29E+04	1.505E+09	8.778E+00	2.32E+08	-5.00E+08	-1.36E+08	3.00E+00	2.50E-01	3	4.30907E-01		
21	-2.818E+10	-4.44E+02	1.92E+04	1.416E+09	8.693E+00	2.83E+08	-5.07E+08	-1.21E+08	3.25E+00	2.50E-01	3	4.26715E-01		
22	-3.248E+10	-1.53E+03	1.13E+04	1.394E+09	8.669E+00	2.73E+08	-5.27E+08	-1.26E+07	3.50E+00	2.50E-01	3	4.25540E-01		
23	-5.097E+10	-8.80E+02	-1.65E+03	1.445E+09	8.553E+00	3.51E+08	-5.08E+08	7.04E+07	3.75E+00	2.50E-01	3	4.19845E-01		
24	-2.144E+10	-7.51E+02	-1.04E+04	1.287E+09	8.748E+00	-2.19E+08	2.38E+08	3.98E+08	4.00E+00	2.50E-01	3	4.29420E-01		
25	1.012E+06	6.97E+02	4.85E+03	1.375E+09	1.316E+00	-1.73E+08	4.70E+08	0.	4.25E+00	2.50E-01	1	4.44635E-05	3	6.45683E-02
26	1.301E+06	7.53E+00	3.87E+03	2.239E+09	1.439E-03	0.	0.	0.	4.50E+00	2.50E-01	1	7.06504E-05		
27	1.044E+06	-7.98E+00	1.29E+03	2.063E+09	1.251E-03	0.	0.	0.	4.75E+00	2.50E-01	1	6.13958E-05		
28	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	5.00E+00	2.50E-01	1	6.01320E-05		

+

ENERGY MAP

+

+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ALTITUDE
12345678901234567890
METERS
1 -1.750E-02
2 -1.500E-02
3 -1.250E-02
4 -1.000E-02
5 -7.500E-03
6 -5.000E-03
7 -2.500E-03
8 0.
9 2.500E-03
10 5.000E-03
11 7.500E-03
12 1.000E-02
13 TTTT 1.250E-02
14 B BT 1.500E-02
15 BTB BT 1.750E-02
16 T TTTBT 2.000E-02
17 B 2.250E-02
18 TT 2.500E-02
19 BT 2.750E-02
20 BTB 3.000E-02
21 T TTTTTTTTTT 3.250E-02
22 BBBB 3.500E-02
23 B BBBBB 3.750E-02
24 T BBB TTT 4.000E-02
25 BB T T BB 4.250E-02
26 BT B BBB 4.500E-02
27 TTTT TTB TTTTTTTTT 4.750E-02
28 TTT 5.000E-02
12345678901234567890
1 2

1 2
ALTITUDE
12345678901234567890
METERS
1 -1.750E-02
2 -1.500E-02
3 -1.250E-02
4 -1.000E-02
5 -7.500E-03
6 -5.000E-03
7 -2.500E-03
8 0.


MATERIAL MAP
9 2.500E-03
10 5.000E-03
11 7.500E-03
12 1.000E-02
13 1.250E-02
14 1.500E-02
15 1.750E-02
16 2.000E-02
17 2.250E-02
18 2.500E-02
19 2.750E-02
20 3.000E-02
21 3.250E-02
22 3.500E-02
23 3.750E-02
24 4.000E-02

```
        0  X
 25 ++++++++XXX+++++++++  4.250E-02

    0000   X   XXXXXXXXX
 26 ++++++++++++++++++++  4.500E-02

           XXX
 27 ++++++++++++++++++++  4.750E-02
 28 ++++++++++++++++++++  5.000E-02
    12345670901234567890
              1         2
   CYCLE   105   TIME 1.4163E-05  DT 1.623E-07   IDT    9  JDT   25
   CYCLE   106   TIME 1.4325E-05  DT 1.625E-07   IDT    9  JDT   25
   CYCLE   107   TIME 1.4488E-05  DT 1.626E-07   IDT    9  JDT   25
   CYCLE   108   TIME 1.4650E-05  DT 1.628E-07   IDT    9  JDT   25
   CYCLE   109   TIME 1.4813E-05  DT 1.029E-07   IDT   10  JDT   26
   CYCLE   110   TIME 1.4916E-05  DT 8.416E-08   IDT   10  JDT   26
   CYCLE   111   TIME 1.5000E-05  DT 1.630E-07   IDT   10  JDT   26
+
+
**********
**********
+
PROB    1.2000     CYCLE   111     TIME  1.500000E-05     DT  1.629873E-07
+
+
+
    INTERNAL ENERGY          KINETIC ENERGY          TOTAL ENERGY                ETH                 REL ERROR
 1.952400032268 47E+12   2.382014218031 40E+13   2.577254221258 24E+13   2.579141363527 20E+13   -1.188154007360 36E+02
+
                                                      TOTAL MASS                  MTH                 RELMERR
                                                 6.670997553095 69E+02   6.670997553090 13E+02   6.544110582808 75E-08
+
MAX VEL =  3.18764E+05 AT I  14 J  27
+
MAX CS =   4.93084E+05 AT I   1 J  14
+
MAX TEMP=  4.04418E+03 AT I  11 J  27
+
MAX P =   5.11725E+10 AT I   1 J  22
+
CELL SETTING DT, I  10 J  26
+
+
TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN, 42 SEC
                  OF THIS       0 HOURS,  0 MIN,  0 SEC IS 6600 TIME.
                    AND         0 HOURS,  0 MIN, 42 SEC IS 7600/176 TIME.
+
TIME FOR THIS RUN     0 HOURS,  1 MIN,  4 SEC
+
WHIZ FACTOR TOTAL PROBLEM   = 6.91E-04 SEC/CELL/CYCLE
+
WHIZ FACTOR SINCE LAST DUMP = 6.89E-04 SEC/CELL/CYCLE
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I= 1 X(I)= .250 DX(I)= .250

J	P	U	V	XI	RHO	SRR	SZZ	SRZ	Y	DY	M	XM	M	XM
1	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.75E+00	2.50E-01	1	6.01320E-05		
2	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.50E+00	2.50E-01	1	6.01321E-05		
3	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.25E+00	2.50E-01	1	6.01324E-05		
4	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.00E+00	2.50E-01	1	6.01348E-05		
5	1.013E+06	-4.69E-02	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-7.50E-01	2.50E-01	1	6.01511E-05		
6	1.016E+06	-6.19E-01	3.00E+05	2.046E+09	1.227E-03	0.	0.	0.	-5.00E-01	2.50E-01	1	6.02532E-05		
7	1.030E+06	-6.25E+00	3.00E+05	2.056E+09	1.239E-03	0.	0.	0.	-2.50E-01	2.50E-01	1	6.08033E-05		
8	1.112E+06	-5.55E+01	2.98E+05	2.137E+09	1.288E-03	0.	0.	0.	0.	2.50E-01	1	6.32109E-05		
9	1.573E+06	-3.57E+02	2.89E+05	2.697E+09	1.455E-03	0.	0.	0.	2.50E-01	2.50E-01	1	7.14042E-05		
10	3.701E+06	-1.17E+03	2.65E+05	5.037E+09	1.890E-03	0.	0.	0.	5.00E-01	2.50E-01	1	9.27756E-05		
11	9.965E+06	-1.06E+03	2.21E+05	9.477E+09	2.061E-03	0.	0.	0.	7.50E-01	2.50E-01	1	1.40432E-04		
12	1.852E+07	1.86E+03	1.74E+05	1.281E+10	4.073E-03	0.	0.	0.	1.00E+00	2.50E-01	1	1.99932E-04		
13	1.740E+07	4.69E+03	1.22E+05	8.480E+09	1.911E+00	9.53E+08	-1.76E+09	0.	1.25E+00	2.50E-01	1	1.40210E-04	2	9.36609E-02
14	-1.408E+09	2.00E+03	1.21E+05	8.468E+09	7.443E+00	9.00E+09	-1.69E+09	4.47E+08	1.50E+00	2.50E-01	1	3.84265E-13	2	3.65382E-01
15	4.034E+04	2.36E+03	1.13E+05	8.655E+09	3.255E+00	8.20E+08	-1.67E+09	0.	1.75E+00	2.50E-01	1	1.19220E-06	2	1.59778E-01
16	5.255E+04	6.85E+02	4.71E+04	7.309E+09	7.681E+00	0.	0.	0.	2.00E+00	2.50E-01	3	3.75036E-01	2	1.19878E-03
17	0.	2.41E+03	4.07E+04	5.094E+09	8.305E+00	6.44E+07	-1.33E+08	1.17E+07	2.25E+00	2.50E-01	3	4.07676E-01		
18	-1.108E+10	1.74E+03	3.47E+04	3.002E+09	8.609E+00	2.57E+08	-4.65E+08	-4.89E+07	2.50E+00	2.50E-01	3	4.22577E-01		
19	-1.299E+10	1.11E+03	2.67E+04	1.999E+09	8.724E+00	2.75E+08	-5.04E+08	-7.96E+07	2.75E+00	2.50E-01	3	4.28219E-01		
20	6.717E+08	3.55E+02	2.13E+04	1.543E+09	8.858E+00	2.57E+08	-5.08E+08	-1.10E+08	3.00E+00	2.50E-01	3	4.34818E-01		
21	1.919E+10	-6.44E+02	1.49E+04	1.416E+09	8.989E+00	2.97E+08	-5.07E+08	-1.19E+08	3.25E+00	2.50E-01	3	4.41269E-01		
22	5.659E+10	-9.90E+02	9.56E+03	1.427E+09	9.216E+00	1.85E+08	-5.17E+08	-5.48E+07	3.50E+00	2.50E-01	3	4.52414E-01		
23	5.874E+10	-1.59E+03	1.73E+03	1.456E+09	9.226E+00	2.19E+08	-5.21E+08	5.61E+07	3.75E+00	2.50E-01	3	4.52892E-01		
24	1.938E+10	-5.33E+02	-8.71E+03	1.299E+09	9.004E+00	2.52E+08	-4.58E+08	2.30E+08	4.00E+00	2.50E-01	3	4.41972E-01		
25	9.620E+05	7.79E+02	2.92E+03	1.484E+09	9.265E-01	-1.73E+08	4.70E+08	0.	4.25E+00	2.50E-01	1	4.35561E-05	3	4.54376E-02
26	1.287E+06	1.74E+01	4.22E+03	2.236E+09	1.426E-03	0.	0.	0.	4.50E+00	2.50E-01	1	7.00123E-05		
27	1.059E+06	-5.63E+00	1.75E+03	2.073E+09	1.263E-03	0.	0.	0.	4.75E+00	2.50E-01	1	6.19934E-05		
28	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	5.00E+00	2.50E-01	1	6.01320E-05		

ENERGY MAP

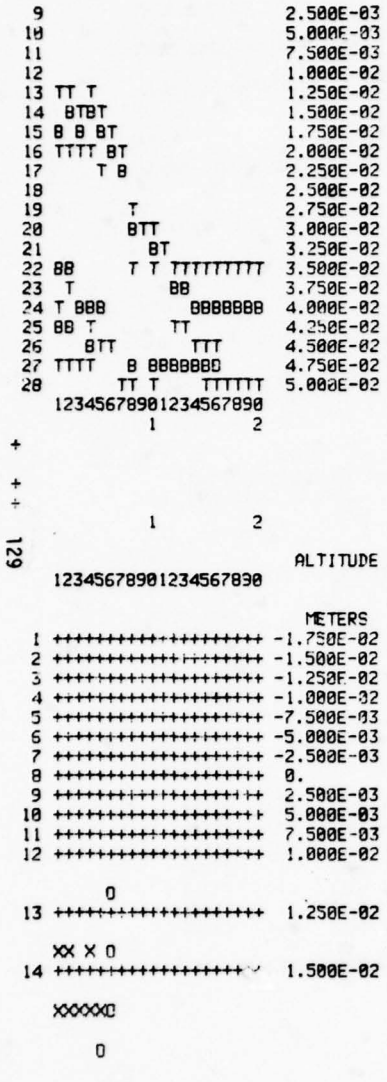
1 2

ALTITUDE

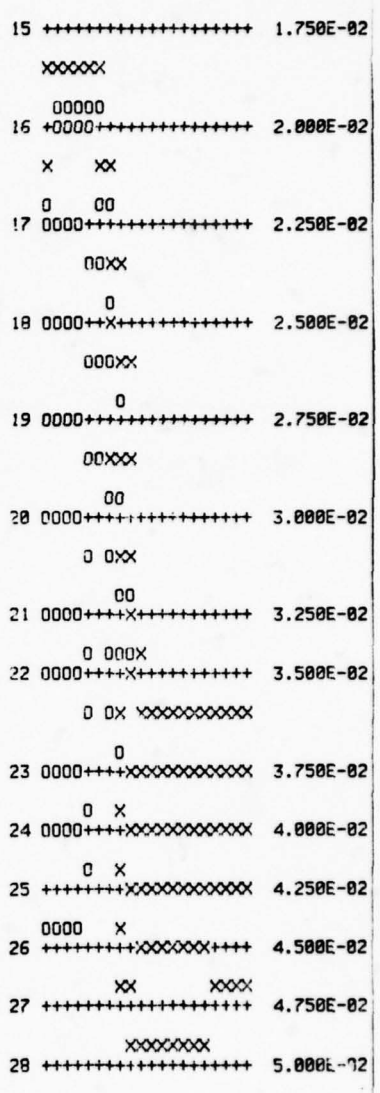
12345678901234567890

METERS

1	-1.750E-02
2	-1.500E-02
3	-1.250E-02
4	-1.000E-02
5	-7.500E-03
6	-5.000E-03
7	-2.500E-03
8	0.



MATERIAL MAP



```
    12345678901234567890
              1         2
   CYCLE   112   TIME 1.5163E-05  DT 1.630E-07   IDT   10  JDT   26
   CYCLE   113   TIME 1.5326E-05  DT 1.630E-07   IDT    9  JDT   26
   CYCLE   114   TIME 1.5489E-05  DT 1.632E-07   IDT    9  JDT   26
   CYCLE   115   TIME 1.5652E-05  DT 1.630E-07   IDT   10  JDT   27
   CYCLE   116   TIME 1.5815E-05  DT 1.016E-07   IDT   10  JDT   27
   CYCLE   117   TIME 1.5817E-05  DT 8.316E-08   IDT   10  JDT   27
   CYCLE   118   TIME 1.6080E-05  DT 1.632E-07   IDT   10  JDT   27
+
**********
*        *
* CSTOP  *
*        *
**********
+
+
**********
**********
+
PROB    1.2000     CYCLE   118     TIME  1.600000E-05     DT  1.631986E-07
+
+
+
     INTERNAL ENERGY          KINETIC ENERGY          TOTAL ENERGY              ETH                  REL ERROR
   1.8965469612477 0E+12   2.2032940455055 0E+13   2.3929487416302 6E+13   2.3955276258055 7E+13  -2.8899156373221 6E+02
+
                                                      TOTAL MASS                MTH                  RELMERR
                                                   6.2791977935967 2E+02   6.2791977935907 2E+02   6.9524399644841 5E-08
+
MAX VEL =  3.01382E+05 AT I  12 J  27
+
MAX CS =   4.87076E+05 AT I   9 J  22
+
MAX TEMP=  3.79488E+03 AT I  20 J  27
+
MAX P =   7.17497E+10 AT I   3 J  15
+
CELL SETTING DT, I  10 J  27
+
+
TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN, 45 SEC
                  OF THIS       0 HOURS,  0 MIN,  0 SEC IS 6600 TIME.
                      AND       0 HOURS,  0 MIN, 45 SEC IS 7600/176 TIME.
+
TIME FOR THIS RUN     0 HOURS,  1 MIN,  7 SEC
+
WHIZ FACTOR TOTAL PROBLEM   = 6.93E-04 SEC/CELL/CYCLE
+
WHIZ FACTOR SINCE LAST DUMP = 7.41E-04 SEC/CELL/CYCLE
+
+
+
+
```

I = 1 X(I)= .250 DX(I)= .250

J	P	U	V	XI	RHO	SRR	SZZ	SRZ	Y	DY	M	XM	M	XM
1	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.75E+00	2.50E-01	1	6.01320E-05		
2	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.50E+00	2.50E-01	1	6.01321E-05		
3	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.25E+00	2.50E-01	1	6.01322E-05		
4	1.013E+06	0.	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-1.00E+00	2.50E-01	1	6.01334E-05		
5	1.013E+06	-2.86E-02	3.00E+05	2.044E+09	1.225E-03	0.	0.	0.	-7.50E-01	2.50E-01	1	6.01416E-05		
6	1.014E+06	-3.53E-01	3.00E+05	2.045E+09	1.226E-03	0.	0.	0.	-5.00E-01	2.50E-01	1	6.01925E-05		
7	1.022E+06	-3.33E+00	3.00E+05	2.050E+09	1.232E-03	0.	0.	0.	-2.50E-01	2.50E-01	1	6.04778E-05		
8	1.062E+06	-2.82E+01	2.99E+05	2.084E+09	1.260E-03	0.	0.	0.	0.	2.50E-01	1	6.18321E-05		
9	1.289E+06	-2.00E+02	2.94E+05	2.345E+09	1.364E-03	0.	0.	0.	2.50E-01	2.50E-01	1	6.69779E-05		
10	2.489E+06	-8.77E+02	2.77E+05	3.768E+09	1.671E-03	0.	0.	0.	5.00E-01	2.50E-01	1	8.20021E-05		
11	6.820E+06	-1.53E+03	2.40E+05	7.607E+09	2.382E-03	0.	0.	0.	7.50E-01	2.50E-01	1	1.16920E-04		
12	1.634E+07	2.95E+02	1.93E+05	1.207E+10	3.787E-03	0.	0.	0.	1.00E+00	2.50E-01	1	1.85901E-04		
13	1.935E+07	3.80E+03	1.40E+05	1.334E+10	4.108E-03	0.	0.	0.	1.25E+00	2.50E-01	1	2.01650E-04		
14	1.950E+07	-1.33E+03	1.21E+05	8.475E+09	5.715E+00	1.64E+09	-1.39E+09	0.	1.50E+00	2.50E-01	1	4.57827E-05	2	2.80501E-01
15	8.101E+04	6.80E+02	1.17E+05	8.585E+09	6.680E+00	1.31E+09	-1.57E+09	0.	1.75E+00	2.50E-01	1	4.32607E-07	2	3.27879E-01
16	9.048E+04	-4.63E+03	4.93E+04	7.433E+09	6.525E+00	0.	0.	0.	2.00E+00	2.50E-01	3	3.11741E-01	2	8.54329E-03
17	0.	1.31E+03	4.13E+04	5.473E+09	8.315E+00	2.51E+07	-4.84E+07	2.12E+07	2.25E+00	2.50E-01	3	4.08166E-01		
18	1.234E+10	6.98E+02	3.44E+04	3.405E+09	8.728E+00	2.48E+08	-4.82E+08	-2.11E+07	2.50E+00	2.50E-01	3	4.28455E-01		
19	2.642E+10	7.89E+02	2.36E+04	2.178E+09	8.949E+00	2.53E+08	-5.11E+08	-4.99E+06	2.75E+00	2.50E-01	3	4.39293E-01		
20	4.068E+10	8.96E+02	1.35E+04	1.659E+09	9.095E+00	2.56E+08	-5.22E+08	-1.59E+07	3.00E+00	2.50E-01	3	4.46451E-01		
21	5.935E+10	3.84E+02	5.55E+03	1.538E+09	9.221E+00	2.22E+08	-5.23E+08	2.29E+07	3.25E+00	2.50E-01	3	4.52623E-01		
22	5.266E+10	1.16E+03	2.54E+03	1.445E+09	9.191E+00	1.74E+08	-5.06E+08	9.80E+07	3.50E+00	2.50E-01	3	4.51164E-01		
23	6.152E+10	6.46E+02	8.80E+03	1.494E+09	9.238E+00	-5.14E+08	3.08E+08	-8.49E+07	3.75E+00	2.50E-01	3	4.53492E-01		
24	2.763E+10	1.02E+02	1.39E+04	1.355E+09	9.049E+00	2.81E+07	3.91E+08	1.88E+08	4.00E+00	2.50E-01	3	4.44181E-01		
25	8.991E+05	7.23E+02	1.36E+04	1.349E+09	1.085E+00	-8.33E+07	3.47E+08	0.	4.25E+00	2.50E-01	1	4.15008E-05	3	5.32137E-02
26	1.317E+06	-1.18E+02	4.67E+03	2.255E+09	1.447E-03	0.	0.	0.	4.50E+00	2.50E-01	1	7.10393E-05		
27	1.078E+06	-4.33E+01	2.21E+03	2.085E+09	1.279E-03	0.	0.	0.	4.75E+00	2.50E-01	1	6.28007E-05		
28	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	5.00E+00	2.50E-01	1	6.01320E-05		

ENERGY MAP

1 2

ALTITUDE

12345678901234567890

METERS

1	-1.750E-02
2	-1.500E-02
3	-1.250E-02
4	-1.000E-02
5	-7.500E-03
6	-5.000E-03
7	-2.500E-03
8	0.
9	2.500E-03
10	5.000E-03
11	7.500E-03
12	1.000E-02

```
13                                  1.250E-02
14 TTTTT                            1.500E-02
15 BBBBBT                           1.750E-02
16 TTTT BT                          2.000E-02
17     T BT                         2.250E-02
18        B                         2.500E-02
19         T                        2.750E-02
20        TB                        3.000E-02
21        B                         3.250E-02
22         T T                      3.500E-02
23 B       T T TT                   3.750E-02
24 T BBB          TTTTTTT           4.000E-02
25  B T          BBBBBBBB          4.250E-02
26 B  B           T                 4.500E-02
27 TTTTT          TTT               4.750E-02
28      TT   BBBBBB                 5.000E-02
   12345678901234567890
             1         2
+
                                                MATERIAL MAP
+
+
             1         2

                                    ALTITUDE
   12345678901234567890

                                    METERS
 1 ++++++++++++++++++++ -1.750E-02
 2 ++++++++++++++++++++ -1.500E-02
 3 ++++++++++++++++++++ -1.250E-02
 4 ++++++++++++++++++++ -1.000E-02
 5 ++++++++++++++++++++ -7.500E-03
 6 ++++++++++++++++++++ -5.000E-03
 7 ++++++++++++++++++++ -2.500E-03
 8 ++++++++++++++++++++  0.
 9 ++++++++++++++++++++  2.500E-03
10 ++++++++++++++++++++  5.000E-03
11 ++++++++++++++++++++  7.500E-03
12 ++++++++++++++++++++  1.000E-02

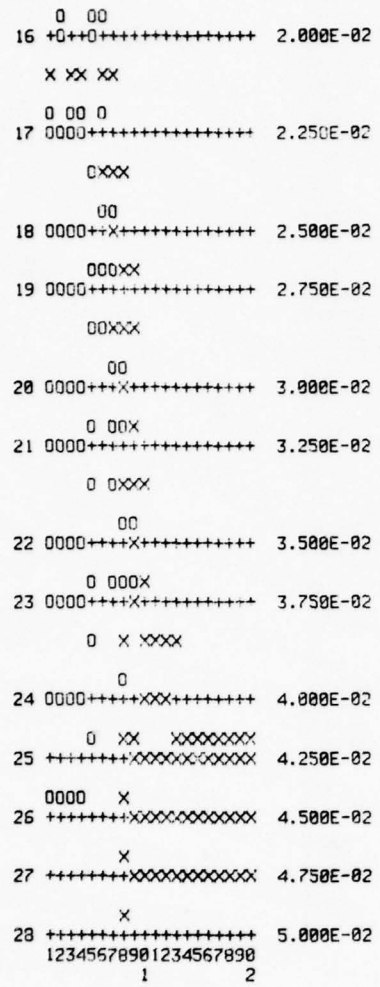
      O
13 ++++++++++++++++++++  1.250E-02

      O
14 ++++++++++++++++++++  1.500E-02

   XXXXXO

      O
15 ++++++++++++++++++++  1.750E-02

   XXXXXX
```




```
:BLK
   PROB          1.20000000000000E+00     17204631463146314632
   ATMOS         5.00000000000000E+00     17225000000000000000
```

BREF	0.	0000000000000000000
CODE	1.000000000000000E+00	1720400000000000000
COLD	0.	7777777777777777776
CYCLE	1.180000000000000E+02	1726730000000000000
DIMEN	2.000000000000000E+00	1721400000000000000
DT	1.631985680017726E-07	1671536356562292435
ELC	2.392948741630260E+13	1774534160446155756
EOS	6.000000000000000E+00	1722600000000000000
ETH	2.395527625805570E+13	1774534460556655407
EXPAND	5.000000000000000E-02	1713631463146314631
FAIL	0.	0000000000000000000
FLUXER	3.000000000000000E+00	1721600000000000000
GEOM	2.000000000000000E+00	1721400000000000000
IMAX	2.000000300000000E+01	1724500000000000000
IO	1.900000000000000E+01	1724460000000000000
ISLAND	0.	0000000000000000000
JMAX	2.800000000000000E+01	1724700000000000000
JO	2.700000000000000E+01	1724660000000000000
KOB	0.	0000000000000000000
LREF	0.	7777777777777777776
METHOD	2.000000000000000E+00	1721400000000000000
MLC	6.279197793596720E+02	1731471753355243752
MTH	6.279197793598720E+02	1731471753355243726
NH	2.000000000000000E+01	1724500000000000000
NHIC	1.600000000000000E+03	1732620000000000000
NHIST	6.000000000000000E+00	1722600000000000000
NM	3.000000300000000E+00	1721600000000000000
NOP	0.	0000000000000000000
NPP	2.000000000000000E+00	1721400000000000000
NROWPB	4.000000000000000E+00	1722400000000000000
PTSTOP	6.000000000000000E+02	1731454000000000000
RADLOS	0.	0000000000000000000
REZONE	0.	0000000000000000000
RREF	0.	0000000000000000000
STABF	5.000000000000000E-01	1717400000000000000
STRAIN	1.000000000000000E+00	1720400000000000000
STRESS	1.000000000000000E+00	1720400000000000000
SUME	0.	0000000000000000000
T	1.599999999999960E-05	1700414336750132755
TERAD	0.	0000000000000000000
TLC	1.599999999999960E-05	1700414336750132755
TREF	0.	0000000000000000000
TTIME	4.582399999999980E+31	1725556457065176763
TTIME6	0.	0000000000000000000
TTIME7	4.582399999999980E+01	1725556457065176763
TTSTOP	1.000000000000000E+02	1726620000000000000
UREZ	1.000000000000000E+01	1723500000000000000
VISC	0.	0000000000000000000
VREZ	1.000000000000000E+01	1723500000000000000
VOIDS	0.	0000000000000000000
WORK	0.	0000000000000000000
X1	4.000000000000000E+00	1722400000000000000
X2	-1.000000000000000E+00	6857377777777777777
XOB	0.	0000000000000000000

```
Y1        5.00000000000000E+00      17225000000000000000
Y2        2.30000000000000E+01      17245600000000000000
YGND      0.                        00000000000000000000
YIELD     0.                        00000000000000000000
AIR       1.00000000000000E+00      17204000000000000000
CU        3.00000000000000E+00      17216000000000000000
FE        2.00000000000000E+00      17214000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
          0.                        00000000000000000000
```

```
  MFX   NOS/BE 1.2    KAFB  011 MFX   07/10/78
  FLCM=314000 MXCM=250000 FLEC=1720K  MXEC=0600K
+
14.56.32.GABY22B  FROM MX2/IS
14.56.32.IP  00000320 WORDS - FILE INPUT  , DC 04
14.56.32.GABY2,T377,NT1.
14.56.34.ACCOUNT.GABY,*********-***,DYP.
14.56.35.SYSBULL(BATCH)
14.56.36.ATTACH,HULLIB,ID=DYMXCER.
14.56.36.PFN IS
14.56.36.HULLIB
14.56.36.PF CYCLE NO. = 039
14.56.36.LIBRARY,HULLIB.
14.56.37.SWITCH,6.
14.56.37.SWITCH,3.
14.56.37.HULLR.
14.56.38.COPYCR(LOCAL,HHH)
14.56.40.RETURN(LOCAL)
14.56.40.IFE,FILE(CHANGES,IN),CPR.
14.56.46.ENDIF,CPR.
14.56.46.IFE,FILE(CHANGES,AS.AND..NOT.IN),CPY.
14.56.48.ENDIF,CPY.
14.56.51.GETC,HHH.
14.56.54.ATTACH(XXX,CH105,ID=DYMXCER)
14.56.55.PF CYCLE NO. = 014
14.56.55.COPYCR(XXX,HHH)
14.56.56.RETURN(XXX)
14.56.57.REVERT.
14.56.58.CONTR,BOW.
14.56.59.      END  CNT
14.56.59.FILE(TAPE10,SBF=NO)
14.57.01.FILE(TAPE11,SBF=NO)
14.57.03.FILE(TAPE41,SBF=NO)
14.57.05.FILE(TAPE42,SBF=NO)
14.57.06.LDSET(FILES=TAPE10/TAPE11/TAPE41/TAPE42)
14.57.07.BOW.
14.57.11.REQUEST(TAPE10,*PF)
14.57.11.REQUEST(TAPE42,*PF)
15.01.52.STERN    6 RESOURCE TAPES REMAINING
15.02.46.CT ID=  DYMXCER PFN=DYMASTLIBRARY
15.02.46.CT CY= 002  00040128 WORDS.
15.02.47.EX ID=  DYMXCER PFN=DYMASTLIBRARY
15.02.47.EX CY= 001  00000000 WORDS.
15.02.55.EX ID=  DYMXCER PFN=DYMASTLIBRARY
15.02.55.EX CY= 001  00040128 WORDS.
15.02.55.PR ID=  DYMXCER PFN=DYMASTLIBRARY
15.02.55.PR CY= 002  00040128 WORDS.
15.04.29.REQUEST(TAPE4,*NT,PE,RING,U,E,VSN=0IK127)
15.04.29.( NT 065 ASSIGNED)
15.04.29.NT65 VOLUME SERIAL NUMBER IS  0IK127
15.04.30.      END  BOW
15.04.30.CONTR,PLANK.
15.04.40.      END  CNT
15.04.40.FILE(TAPE4,SBF=NO)
```

```
15.04.43.FILE(TAPE41,SBF=NO)
15.04.44.LDSET(FILES=TAPE4/TAPE41)
15.04.44.PLANK.
15.04.47.GENERATING HULL      DISK        VERSION
15.04.50.      END  PLANK
15.04.50.CONTR,SAIL.
15.04.55.      END  CNT
15.04.55.DYMAST(I=HHH)
15.07.15.     8325  CARDS GENERATED
15.07.15.  END OF  NORMAL      RUN
15.07.15.  SYSTEM  HULL        VERSION  185
15.07.16.  EXIT
15.07.16.RETURN(HHH)
15.07.16.RETURN(SAVE)
15.07.17.REQUEST(SAVE,*Q)
15.07.18.CONTR,COMPILE.
15.07.19.      END  CNT
15.07.19.IFE,R2.EQ.2,COMPS.
15.07.20.ELSE,COMPS.
15.07.20.FTN(A,I=SAIL,PL=1000000,B=HULL,OPT=2,L=S
15.07.20.AVE)
15.08.16.      7.289 CP SECONDS COMPILATION TIME
15.08.16.ENDIF,COMPS.
15.08.20.RETURN(SAIL,LOCAL)
15.08.21.IFE,R2.NE.0,MET.
15.08.21.ENDIF,MET.
15.08.22.RETURN(MAP)
15.08.22.REQUEST(MAP,*Q)
15.08.23.CONTR,LOAD.
15.08.24.      END  CNT
15.08.24.IFE,R2.EQ.2,RUNS.
15.08.25.ELSE,RUNS.
15.08.25.IFE,R1.NE.0,H176.
15.08.25.HULE176.COMMENT.
15.08.27.FILE(TAPE4,SBF=NO)
15.08.27.FILE(TAPE41,SBF=NO)
15.08.28.FILE(TAPE9,SBF=NO)
15.08.29.FILE(TAPE40,SBF=NO)
15.08.30.FILE(TAPE10,SBF=NO)
15.08.30.FILE(TAPE44,SBF=NO)
15.08.31.FILE(TAPE45,SBF=NO)
15.08.32.LDSET(PRESETA=NGINDEF,MAP=SBEX/MAP)
15.08.32.LDSET(FILES=TAPE4/TAPE41/TAPE9/TAPE40/TA
15.08.32.PE10)
15.08.32.LDSET(FILES=TAPE44/TAPE45)
15.08.32.HULL.
15.21.49.NT65  BLOCKS WRITTEN -000065
15.23.37.NT65  BLOCKS WRITTEN -000096
15.24.16.NT65  BLOCKS WRITTEN -000127
15.24.59.NT65  BLOCKS WRITTEN -000158
15.25.33.NT65  BLOCKS WRITTEN -000189
15.26.02.NT65  BLOCKS WRITTEN -000220
15.26.23.NT65  BLOCKS WRITTEN -000251
15.26.50.NT65  BLOCKS WRITTEN -000282
```

```
15.27.09.MT65  BLOCKS WRITTEN -000313
15.27.56.MT65  BLOCKS WRITTEN -000344
15.28.10.LOCKIN.
15.28.48.MT65  BLOCKS WRITTEN -000375
15.29.37.MT65  BLOCKS WRITTEN -000406
15.30.11.MT65  BLOCKS WRITTEN -000437
15.30.40.MT65  BLOCKS WRITTEN -000468
15.31.10.MT65  BLOCKS WRITTEN -000499
15.31.26.****** TOTAL CYCLE STOP.
15.31.29.MT65  BLOCKS WRITTEN -000530
15.31.31.     END  HULL
15.31.31.    46.381 CP SECONDS EXECUTION TIME
15.31.31.RETURN(TAPE4,HULL)
15.31.32.REVERT.
15.31.35.ELSE,H176.
15.31.37.ENDIF,H176.
15.31.37.ENDIF,RUNS.
15.31.38.ACCOUN.
15.31.40.ACCOUNT FILE = ACCOUNTKJ2BV10F5P8
15.31.40.  ACCOUNT ID = DYMXCER
15.31.50.     END  ACCNT
15.31.50.REVERT.
15.31.51.OP  00016576 WORDS - FILE FILMPR , DC 20
15.31.51.OP  00019200 WORDS - FILE OUTPUT , DC 40
15.31.51.MS   39424  WORDS  (  267776 MAX USED)
15.31.51.CPA     68.479 SEC.       68.479 ADJ.
15.31.51.IO     160.605 SEC.       40.151 ADJ.
15.31.51.CM    5382.543 KWS.       22.585 ADJ.
15.31.51.SS                       131.216
15.31.51.PP     385.244 SEC.     DATE 08/21/78
15.31.51.COST ESTIMATE            $22.04
15.31.51.EJ  END OF JOB, IS
```

SECTION IV

TEST PROBLEM 1.3

Problem 1.3 is another small test problem consisting of 800 zones. It is a multimaterial problem with air, steel, and concrete. The configuration is basically a long narrow steel rod impinging upon a concrete slab at 25,000 ft/s. Stations were used for this run to test that part of the code. The entire JCL output has been listed as an example. Dumps from cycles 0, 10, and 104 have been included. After approximately 3.5 μs the steel penetrator has moved 5 cells into the concrete slab.

PROBLEM 1.3 SYSTEM 370 KEEL RUN

```
//AF2001K JOB (AF2001,,5),'KEEL RUN',MSGCLASS=H,CLASS=B,
//          NOTIFY=AF2001
//KEEL EXEC KEEL,GENO='.V105',FPARM='NOSOURCE,TERM',
//       PS1='SYSOUT=H,HOLD=YES',PS2='SYSOUT=H,HOLD=YES',
//       FP1='SYSOUT=H,HOLD=YES',LP1='SYSOUT=H,HOLD=YES',
//       KP1='SYSOUT=H,HOLD=YES',KTIME=1,LIBPRE='AF2001.',
//       OLDPRE='AF2001.',PP1='SYSOUT=H,HOLD=YES',PTIME='(0,10)'
//KEEL.DATA DD  DSN=AF2001.HULL.PROB1P3,UNIT=SYSDA,DISP=(NEW,CATLG),
//     DCB=(RECFM=VBS,LRECL=7220,BLKSIZE=7224),
//     SPACE=(CYL,(20,20))
//KEEL.STATION  DD DSN=AF2001.HULL.STAT1P3,UNIT=SYSDA,DISP=(NEW,CATLG),
//     DCB=(RECFM=VBS,LRECL=7220,BLKSIZE=7224),
//     SPACE=(CYL,(4,4))
//KEEL.INPUT DD  *
KEEL PROB=1.3
STRESS=1 STRAIN=1 ATMOS=5
IMAX=20 JMAX=40
EOS=6 T=0 NM=3 AIR=1 FE=2 CONCRT=3
FLUXER=3
NSTN=16
HEADER
STEEL PENETRATOR INTO CONCRETE
MESH XMAX=10,Y0=-10 YMAX=10
GENERATE
PACKAGE AIR
RECTANGLE Y2=0
RECTANGLE X2=1 Y1=-8 Y2=0
PACKAGE FE V=7.62E5
RECTANGLE X2=1 Y1=-8 Y2=0
PACKAGE CONCRT
RECTANGLE Y1=0
STATIONS
XL=0 YL=-8 -7 -5 -3 -1 0 .5 1 2 3 4 5 6 7 8 9
/*
//SAIL.INPUT  DD  *
 SAIL LINENO
/*
L,2300,2400
END OF DATA
```

```
                                                    J E S 2   J O B   L O G
09.56.25 JOB  105  $HASP373 AF2001K  STARTED - INIT  3 - CLASS B - SYS A168
09.56.32 JOB  105  AF2001K  KEEL     09:56:25      7       0.25  S000
09.56.45 JOB  105  AF2001K  PLANK    09:56:33     13       0.75  S000
10.25.42 JOB  105  AF2001K  SAIL     09:56:46   1735     112.47  S000
10.36.59 JOB  105  AF2001K  FORT     10:25:42    677      19.97  S004
10.37.24 JOB  105  AF2001K  LKED     10:36:59     25       2.24  S000
10.38.09 JOB  105  AF2001K  GO       10:37:25     45       5.03  S000
10.38.10 JOB  105  $HASP395 AF2001K  ENDED

OUT
```

```
$HASP165 JOB  '09  AF2001K ENDED CN(00)
    1      //AF2001K JOB (AF2001,,5),'KEEL RUN',MSGCLASS=H,CLASS=B,                JOB  105
           //          NOTIFY=AF2001                                              00000020
           //KEEL    PROC LIB=HULLIB,                                           X00000030
           //             LIBPRE='SAIL.',                                       X00000040
           //             LIBU=,                                                X00000050
           //             LIBVOL=,                                              X00000060
           //             CHNBLK=3521,                                          X00000070
           //             CHNLRL=3517,                                          X00000080
           //             CREG=100K,                                            X00000090
           //             FLIB='SYS1.FORTLIB',                                  X00000100
           //             FILO=,                                                X00000110
           //             FPARM=MAP,                                            X00000120
           //             FPROG=IFEAAB,                                         X00000130
           //             FREG=512K,                                            X00000140
           //             FP1='SYSOUT=A',                                       X00000150
           //             FSPACE='(CYL,(10,5),RLSE)',                           X00000160
           //             FTIME='(1,0)',                                        X00000170
           //             GEMO='(0)',                                           X00000180
           //             GOSPACE='(CYL,(20,5,1))',                             X00000190
           //             LABO=,                                                X00000200
           //             LNAME=KEEL,                                           X00000210
           //             LPARM='MAP',                                          X00000220
           //             LPROG=IEWL,                                           X00000230
           //             LREG=250K,                                            X00000240
           //             LP1='SYSOUT=A',                                       X00000250
           //             LTIME='(0,45)',                                       X00000260
           //             KEELSP='(CYL,(10,5),RLSE)',                           X00000270
           //             KREG=512K,                                            X00000280
           //             KP1='SYSOUT=A',                                       X00000290
           //             KTIME='(2,0)',                                        X00000300
           //             OLD=HULL,                                             X00000310
           //             OLDDCB=,                                              X00000320
           //             OLDDS=SHR,                                            X00000330
           //             OLDPRE='SAIL.',                                       X00000340
           //             OLDU=,                                                X00000350
           //             OLDVOL=,                                              X00000360
           //             PPROG=PLANK,                                          X00000370
           //             PP1='SYSOUT=A',                                       X00000380
           //             PRCN=5000,                                            X00000390
           //             PRCL=3644,                                            X00000400
           //             PREG=100K,                                            X00000410
           //             PTIME='(1,0)',                                        X00000420
           //             PS1='SYSOUT=A',                                       X00000430
           //             PS2='SYSOUT=A',                                       X00000440
           //             SAILBLK=800,                                          X00000450
           //             SAILR=80,                                             X00000460
           //             SCRTC=SYSDA,                                          X00000470
```

```
//             SPROG=SAIL,                                                  X00000480
//             SREG=175K,                                                   X00000490
//             STIME='(2,0)',                                               X00000500
//             WORKSP='(CYL,(5,5))'                                          00000510
//*-------------------------------------------------------------------*      00000520
//KEEL    EXEC PGM=IEBGENER,REGION=&CREG                                    00000530
//SYSPRINT  DD DUMMY                                                        00000540
//SYSIN     DD DUMMY                                                        00000550
//SYSUT1    DD DDNAME=INPUT                                                 00000560
//SYSUT2    DD DSN=&&KEELI,                                                 X00000570
//             DISP=(NEW,PASS),                                             X00000580
//             UNIT=&SCRTC,                                                 X00000590
//             SPACE=(TRK,(5,5),RLSE),                                      X00000600
//             DCB=(RECFM=FB,LRECL=80,BLKSIZE=1600)                          00000610
//*-------------------------------------------------------------------*      00000620
//PLANK   EXEC PGM=&PPROG,TIME=&PTIME,REGION=&PREG                          00000630
//*                                                                         00000640
//STEPLIB   DD DSN=&LIBPRE&LIB,                                             X00000650
//             UNIT=&LIBU,                                                  X00000660
//             VOL=&LIBVOL,                                                 X00000670
//             DISP=SHR                                                     00000680
//*                                                                         00000690
//FT05F001  DD DSN=&&KEELI,DISP=(OLD,PASS)                                  00000700
//*                                                                         00000710
//FT06F001  DD &PP1,                                                        X00000720
//             DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                       00000730
//*                                                                         00000740
//FT07F001  DD DSN=&&ALTI,                                                  X00000750
//             DISP=(NEW,PASS),                                             X00000760
//             UNIT=&SCRTC,                                                 X00000770
//             SPACE=(TRK,(5,5),RLSE),                                      X00000780
//             DCB=(RECFM=FB,LRECL=80,BLKSIZE=1600)                         00000790
//*-------------------------------------------------------------------*      00000800
//SAIL    EXEC PGM=&SPROG,TIME=&STIME,REGION=&SREG,                         X00000810
//             COND=(8,LT,PLANK)                                            00000820
//*                                                                         00000830
//STEPLIB   DD DSN=&LIBPRE&LIB,                                             X00000840
//             UNIT=&LIBU,                                                  X00000850
//             VOL=&LIBVOL,                P                                X00000860
//             DISP=SHR                                                     00000870
//*                                                                         00000880
//FT01F001  DD DUMMY                                                        00000890
//*                                                                         00000900
//FT02F001  DD DSN=&OLDPRE&OLD&GENO,                                        X00000910
//             UNIT=&OLDU,                                                  X00000920
//             LABEL=(&FILO,&LABO,,IN),                                     X00000930
//             DISP=&OLDDS,                                                 X00000940
//             VOL=&OLDVOL,                                                 X00000950
//             DCB=&OLDDCB                                                  00000960
//*                                                                         00000970
//FT03F001  DD UNIT=&SCRTC,                                                 X00000980
```

```
//             DISP=(NEW,DELETE),                                    X00000990
//             DCB=(RECFM=VBS,LRECL=&CHNLRL,BLKSIZE=&CHNBLK),        X00001000
//             SPACE=(TRK,(20,20))                                    00001010
//*                                                                   00001020
//FT04F001  DD &PS2,                                                 X00001030
//             DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                 00001040
//*                                                                   00001050
//FT05F001  DD DDNAME=INPUT                                          00001060
//*                                                                   00001070
//FT06F001  DD &PS1,                                                 X00001080
//             DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                 00001090
//*                                                                   00001100
//FT08F001  DD DSN=&&KEEL,                                           X00001110
//             DISP=(NEW,PASS),                                      X00001120
//             UNIT=&SCRTC,                                          X00001130
//             SPACE=&KEELSP,                                        X00001140
//             DCB=(RECFM=FB,LRECL=&SAILR,BLKSIZE=&SAILBLK)           00001150
//*                                                                   00001160
//FT09F001  DD DSN=&&ALTI,DISP=(OLD,DELETE)                          00001170
//*                                                                   00001180
//FT10F001  DD UNIT=&SCRTC,                                          X00001190
//             DISP=(NEW,DELETE),                                    X00001200
//             SPACE=(&PRCL,(&PRCN))                                  00001210
//*                                                                   00001220
//FT11F001  DD DUMMY                                                 00001230
//*                                                                   00001240
//FT12F001  DD DUMMY                                                 00001250
//*------------------------------------------------------------------* 00001260
//FORT    EXEC PGM=&FPROG,REGION=&FREG,PARM='&FPARM',TIME=&FTIME,    X00001270
//             COND=((8,LT,PLANK),(8,LT,SAIL))                        00001280
//*                                                                   00001290
//SYSPRINT  DD &FP1,                                                 X00001300
//             DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                 00001310
//*                                                                   00001320
//SYSLIN    DD DSN=&&LOADSET,                                        X00001330
//             DISP=(MOD,PASS),                                      X00001340
//             UNIT=&SCRTC,                                          X00001350
//             SPACE=&FSPACE,                                        X00001360
//             DCB=(RECFM=BF,LRECL=80,BLKSIZE=1600)                   00001370
//*                                                                   00001380
//SYSIN     DD DSN=&&KEEL,DISP=(OLD,DELETE)                          00001390
//*                                                                   00001400
//SYSUT1    DD UNIT=&SCRTC,SPACE=(CYL,(2,2))                         00001410
//*                                                                   00001420
//SYSUT2    DD UNIT=&SCRTC,SPACE=(CYL,(2,2))                         00001430
//*                                                                   00001440
//SYSTERM   DD DUMMY                                                 00001450
//*------------------------------------------------------------------* 00001460
//LKED    EXEC PGM=&LPROG,REGION=&LREG,TIME=&LTIME,                  X00001470
//             COND=((4,LT,FORT),(8,LT,SAIL),(8,LT,PLANK)),          X00001480
//             PARM='&LPARM'                                          00001490
```

```
//*                                                                    00001500
//SYSPRINT  DD &LP1,                                                  X00001510
//             DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                  00001520
//*                                                                    00001530
//SYSLIB    DD DSN=&LIBPRE&LIB,DISP=SHR                               00001540
//          DD DSN=&FLIB,DISP=SHR                                     00001550
//*                                                                    00001560
//SYSUT1    DD UNIT=&SCRTC,SPACE=(1024,(200,20))                      00001570
//*                                                                    00001580
//SYSLMOD   DD DSN=&&GOSET(&LNAME),                                   X00001590
//             UNIT=&SCRTC,                                           X00001600
//             DISP=(,PASS),                                          X00001610
//             SPACE=&GOSPACE                                         X00001620
//*                                                                    00001630
//SYSLIN    DD DSN=&&LOADSET,DISP=(OLD,DELETE)                        00001640
//*--------------------------------------------------------------------00001650
//GO      EXEC PGM=*.LKED.SYSLMOD,TIME=&KTIME,REGION=&KREG,           X00001660
//             COND=((4,LT,LKED),(4,LT,FORT),(8,LT,SAIL),(8,LT,PLANK)) 00001670
//*                                                                    00001680
//FT04F001  DD DSN=*.KEEL.DATA,DISP=(OLD,KEEP)                        00001690
//*                                                                    00001700
//FT05F001  DD DSN=&&KEELI,DISP=(OLD,DELETE)                          00001710
//*                                                                    00001720
//FT06F001  DD &KP1,                                                  X00001730
//             DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                  00001740
//*                                                                    00001750
//FT09F001  DD DSNAME=*.KEEL.STATION,DISP=(OLD,KEEP)                  00001760
//*                                                                    00001770
//FT10F001  DD UNIT=&SCRTC,                                           X00001780
//             SPACE=&WORKSP,                                         X00001790
//             DISP=(NEW,DELETE),                                     X00001800
//             DCB=*.KEEL.DATA                                         00001810
//*                                                                    00001820
//FT11F001  DD UNIT=&SCRTC,                                           X00001830
//             SPACE=&WORKSP,                                         X00001840
//             DISP=(NEW,DELETE),                                     X00001850
//             DCB=*.KEEL.DATA                                         00001860
//*                                                                    00001870
//FT14F001  DD UNIT=&SCRTC,                                           X00001880
//             SPACE=&WORKSP,                                         X00001890
//             DISP=(NEW,DELETE),                                     X00001900
//             DCB=*.KEEL.DATA                                         00001910
//*                                                                    00001920
//FT21F001  DD UNIT=&SCRTC,                                           X00001930
//             SPACE=&WORKSP,                                         X00001940
//             DISP=(NEW,DELETE),                                     X00001950
//             DCB=*.KEEL.DATA                                         00001960
//*                                                                    00001970
//FT44F001  DD UNIT=&SCRTC,                                           X00001980
//             SPACE=&WORKSP,                                         X00001990
//             DISP=(NEW,DELETE),                                     X00002000
```

```
//             DCB=*.KEEL.DATA                                          00002010
//*                                                                     00002020
//FT45F001  DD UNIT=&SCRTC,                                            X00002030
//             SPACE=&WORKSP,                                          X00002040
//             DISP=(NEW,DELETE),                                      X00002050
//             DCB=*.KEEL.DATA                                         00002060
//*                                                                     00002070
//       PEND                                                         00002080
2      //KEEL EXEC KEEL,GENO='.V105',FPARM='NOSOURCE,TERM',           00002090
//       PS1='SYSOUT=H,HOLD=YES',PS2='SYSOUT=H,HOLD=YES',             00002100
//       FP1='SYSOUT=H,HOLD=YES',LP1='SYSOUT=H,HOLD=YES',             00002110
//       KP1='SYSOUT=H,HOLD=YES',KTIME=1,LIBPRE='AF2001.',            00002120
//       OLDPRE='AF2001.',PP1='SYSOUT=H,HOLD=YES',PTIME='(0,10)'      00002130
3      ++KEEL    PROC LIB=HULLIB,                                     X00000030
++             LIBPRE='SAIL.',                                         X00000040
++             LIBU=,                                                  X00000050
++             LIBVOL=,                                                X00000060
++             CHNBLK=3521,                                            X00000070
++             CHNLRL=3517,                                            X00000080
++             CREG=100K,                                              X00000090
++             FLIB='SYS1.FORTLIB',                                    X00000100
++             FILO=,                                                  X00000110
++             FPARM=MAP,                                              X00000120
++             FPROG=IFEAAB,                                           X00000130
++             FREG=512K,                                              X00000140
++             FP1='SYSOUT=A',                                         X00000150
++             FSPACE='(CYL,(10,5),RLSE)',                             X00000160
++             FTIME='(1,0)',                                          X00000170
++             GENO='(0)',                                             X00000180
++             GOSPACE='(CYL,(20,5,1))',                               X00000190
++             LABO=,                                                  X00000200
++             LNAME=KEEL,                                             X00000210
++             LPARM='MAP',                                            X00000220
++             LPROG=IEWL,                                             X00000230
++             LREG=250K,                                              X00000240
++             LP1='SYSOUT=A',                                         X00000250
++             LTIME='(0,45)',                                         X00000260
++             KEELSP='(CYL,(10,5),RLSE)',                             X00000270
++             KREG=512K,                                              X00000280
++             KP1='SYSOUT=A',                                         X00000290
++             KTIME='(2,0)',                                          X00000300
++             OLD=HULL,                                               X00000310
++             OLDDCB=,                                                X00000320
++             OLDDS=SHR,                                              X00000330
++             OLDPRE='SAIL.',                                         X00000340
++             OLDU=,                                                  X00000350
++             OLDVOL=,                                                X00000360
++             PPROG=PLANK,                                            X00000370
++             PP1='SYSOUT=A',                                         X00000380
++             PRCN=5000,                                              X00000390
++             PRCL=3644,                                              X00000400
```

```
++            PREG=100K,                                                X00000410
++            PTIME='(1,0)',                                            X00000420
++            PS1='SYSOUT=A',                                           X00000430
++            PS2='SYSOUT=A',                                           X00000440
++            SAILBLK=800,                                              X00000450
++            SAILR=80,                                                 X00000460
++            SCRTC=SYSDA,                                              X00000470
++            SPROG=SAIL,                                               X00000480
++            SREG=175K,                                                X00000490
++            STIME='(2,0)',                                            X00000500
++            WORKSP='(CYL,(5,5))'                                       00000510
***-------------------------------------------------------------------* 00000520
 4    ++KEEL    EXEC PGM=IEBGENER,REGION=&CREG                           00000530
 5    ++SYSPRINT  DD DUMMY                                               00000540
 6    ++SYSIN     DD DUMMY                                               00000550
 7    ++SYSUT1    DD DDNAME=INPUT                                        00000560
 8    ++SYSUT2    DD DSN=&&KEELI,                                        X00000570
++               DISP=(NEW,PASS),                                       X00000580
++               UNIT=&SCRTC,                                           X00000590
++               SPACE=(TRK,(5,5),RLSE),                                X00000600
++               DCB=(RECFM=FB,LRECL=80,BLKSIZE=1600)                    00000610
***-------------------------------------------------------------------* 00000620
 9    //KEEL.DATA DD  DSN=AF2001.HULL.PROB1P3,UNIT=SYSDA,DISP=(NEW,CATLG),  00002140
//     DCB=(RECFM=VBS,LRECL=7220,BLKSIZE=7224),                           00002150
//     SPACE=(CYL,(20,20))                                                00002160
10   //KEEL.STATION  DD DSN=AF2001.HULL.STAT1P3,UNIT=SYSDA,DISP=(NEW,CATLG), 00002170
//     DCB=(RECFM=VBS,LRECL=7220,BLKSIZE=7224),                           00002180
//     SPACE=(CYL,(4,4))                                                  00002190
11   //KEEL.INPUT DD  *                                                   00002200
12   ++PLANK   EXEC PGM=&PPROG,TIME=&PTIME,REGION=&PREG                   00000630
***                                                                       00000640
13   ++STEPLIB   DD DSN=&LIBPRE&LIB,                                      X00000650
++               UNIT=&LIBU,                                            X00000660
++               VOL=&LIBVOL,                                           X00000670
++               DISP=SHR                                                00000680
***                                                                       00000690
14   ++FT05F001  DD DSN=&&KEELI,DISP=(OLD,PASS)                           00000700
***                                                                       00000710
15   ++FT06F001  DD &PP1,                                                 X00000720
++               DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                  00000730
***                                                                       00000740
16   ++FT07F001  DD DSN=&&ALTI,                                           X00000750
++               DISP=(NEW,PASS),                                       X00000760
++               UNIT=&SCRTC,                                           X00000770
++               SPACE=(TRK,(5,5),RLSE),                                X00000780
++               DCB=(RECFM=FB,LRECL=80,BLKSIZE=1600)                    00000790
***-------------------------------------------------------------------* 00000800
17   ++SAIL    EXEC PGM=&SPROG,TIME=&STIME,REGION=&SREG,                  X00000810
++               COND=(8,LT,PLANK)                                       00000820
***                                                                       00000830
18   ++STEPLIB   DD DSN=&LIBPRE&LIB,                                      X00000840
```

```
         ++            UNIT=&LIBU,                                          X00000850
         ++            VOL=&LIBVOL,                                         X00000860
         ++            DISP=SHR                                              00000870
         ***                                                                 00000880
19       ++FT01F001  DD DUMMY                                                00000890
         ***                                                                 00000900
20       ++FT02F001  DD DSN=&OLDPRE&OLD&GENO,                                X00000910
         ++            UNIT=&OLDU,                                          X00000920
         ++            LABEL=(&FILO,&LABO,,IN),                             X00000930
         ++            DISP=&OLDDS,                                         X00000940
         ++            VOL=&OLDVOL,                                         X00000950
         ++            DCB=&OLDDCB                                           00000960
         ***                                                                 00000970
21       ++FT03F001  DD UNIT=&SCRTC,                                         X00000980
         ++            DISP=(NEW,DELETE),                                   X00000990
         ++            DCB=(RECFM=VBS,LRECL=&CHNLRL,BLKSIZE=&CHNBLK),       X00001000
         ++            SPACE=(TRK,(20,20))                                   00001010
         ***                                                                 00001020
22       ++FT04F001  DD &PS2,                                                X00001030
         ++            DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                00001040
         ***                                                                 00001050
23       ++FT05F001  DD DDNAME=INPUT                                         00001060
         ***                                                                 00001070
24       ++FT06F001  DD &PS1,                                                X00001080
         ++            DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                00001090
         ***                                                                 00001100
25       ++FT08F001  DD DSN=&&KEEL,                                          X00001110
         ++            DISP=(NEW,PASS),                                     X00001120
         ++            UNIT=&SCRTC,                                         X00001130
         ++            SPACE=&KEELSP,                                       X00001140
         ++            DCB=(RECFM=FB,LRECL=&SAILR,BLKSIZE=&SAILBLK)          00001150
         ***                                                                 00001160
26       ++FT09F001  DD DSN=&&ALTI,DISP=(OLD,DELETE)                         00001170
         ***                                                                 00001180
27       ++FT10F001  DD UNIT=&SCRTC,                                         X00001190
         ++            DISP=(NEW,DELETE),                                   X00001200
         ++            SPACE=(&PRCL,(&PRCN))                                 00001210
         ***                                                                 00001220
28       ++FT11F001  DD DUMMY                                                00001230
         ***                                                                 00001240
29       ++FT12F001  DD DUMMY                                                00001250
         ***------------------------------------------------------------------* 00001260
30       //SAIL.INPUT  DD  *                                                 00002410
31       //SYSIN     DD *                GENERATED STATEMENT
32       ++FORT    EXEC PGM=&FPROG,REGION=&FREG,PARM='&FPARM',TIME=&FTIME,   X00001270
         ++            COND=((8,LT,PLANK),(8,LT,SAIL))                       00001280
         ***                                                                 00001290
33       ++SYSPRINT  DD &FP1,                                                X00001300
         ++            DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                00001310
         ***                                                                 00001320
34       ++SYSLIN    DD DSN=&&LOADSET,                                       X00001330
```

```
++             DISP=(MOD,PASS),                                          X00001340
++             UNIT=&SCRTC,                                              X00001350
++             SPACE=&FSPACE,                                            X00001360
++             DCB=(RECFM=BF,LRECL=80,BLKSIZE=1600)                       00001370
***                                                                       00001380
35   ++SYSIN     DD DSN=&&KEEL,DISP=(OLD,DELETE)                          00001390
***                                                                       00001400
36   ++SYSUT1    DD UNIT=&SCRTC,SPACE=(CYL,(2,2))                         00001410
***                                                                       00001420
37   ++SYSUT2    DD UNIT=&SCRTC,SPACE=(CYL,(2,2))                         00001430
***                                                                       00001440
38   ++SYSTERM   DD DUMMY                                                 00001450
***------------------------------------------------------------------*    00001460
39   ++LKED    EXEC PGM=&LPROG,REGION=&LREG,TIME=&LTIME,                  X00001470
++             COND=((4,LT,FORT),(8,LT,SAIL),(8,LT,PLANK)),              X00001480
++             PARM='&LPARM'                                              00001490
***                                                                       00001500
40   ++SYSPRINT  DD &LP1,                                                 X00001510
++             DCB=(RE**ZFBA,LRECL=133,BLKSIZE=1330)                      00001520
***                                                                       00001530
41   ++SYSLIB    DD DSN=&LIBPRE&LIB,DISP=SHR                              00001540
42   ++          DD DSN=&FLIB,DISP=SHR                                    00001550
***                 *                                                   00001560
43   ++SYSUT1    DD UNIT=&SCRTC,SPACE=(1024,(200,20))                     00001570
***                *                                                    00001580
44   ++SYSLMOD   DD DSN=&&GOSET(&LNAME),                                  X00001590
++             UNIT=&SCRTC,                                              X00001600
++             DISP=(,PASS),                                             X00001610
++             SPACE=&GOSPACE                                             00001620
***                      ** * *                                           00001630
45   ++SYSLIN    DD DSN=&&LOADSET,DISP=(OLD,DELETE)                       00001640
***------------------------------------------------------------------*    00001650
46   ++GO      EXEC PGM=*.LKED.SYSLMOD,TIME=&KTIME,REGION=&KREG,          X00001660
++             COND=((4,LT,LKED),(4,LT,FORT),(8,LT,SAIL),(8,LT,PLANK))    00001670
***                                                                       00001680
47   ++FT04F001  DD DSN=*.KEEL.DATA,DISP=(OLD,KEEP)                       00001690
***                                                                       00001700
48   ++FT05F001  DD DSN=&&KEELI,DISP=(OLD,DELETE)                         00001710
***                                                                       00001720
49   ++FT06F001  DD &KP1,                                                 X00001730
++           DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                       00001740
***                                                                       00001750
50   ++FT09F001  DD DSNAME=*.KEEL.STATION,DISP=(OLD,KEEP)        **       00001760
***                                                                       00001770
51   ++FT10F001  DD UNIT=&SCRTC,                                          X00001780
++             SPACE=&WORKSP,                                            X00001790
++             DISP=(NEW,DELETE),                                        X00001800
++             DCB=*.KEEL.DATA                                            00001810
***                                                                       00001820
52   ++FT11F001  DD UNIT=&SCRTC,                                          X00001830
++             SPACE=&WORKSP,                                            X00001840
```

```
            ++              DISP=(NEW,DELETE),                          X00001850
            ++              DCB=*.KEEL.DATA                              00001860
            ***                                                          00001870
      53    ++FT14F001  DD  UNIT=&SCRTC,                                X00001880
            ++              SPACE=&WORKSP,                              X00001890
            ++              DISP=(NEW,DELETE),                          X00001900
            ++              DCB=*.KEEL.DATA                              00001910
            ***                                                          00001920
      54    ++FT21F001  DD  UNIT=&SCRTC,                                X00001930
            ++              SPACE=&WORKSP,                              X00001940
            ++              DISP=(NEW,DELETE),                          X00001950
            ++              DCB=*.KEEL.DATA                              00001960
            ***                                                          00001970
      55    ++FT44F001  DD  UNIT=&SCRTC,                                X00001980
            ++              SPACE=&WORKSP,                              X00001990
            ++              DISP=(NEW,DELETE),                          X00002000
            ++              DCB=*.KEEL.DATA                              00002010
            ***                                                          00002020
      56    ++FT45F001  DD  UNIT=&SCRTC,                                X00002030
            ++              SPACE=&WORKSP,                              X00002040
            ++              DISP=(NEW,DELETE),                          X00002050
            ++              DCB=*.KEEL.DATA                              00002060
            ***                                                          00002070

OUT
```

GENERATING KEEL
DISK VERSION
KEEL RUN

EQUATION OF STATE -
SOLIDS - NO STRENGTH
ATMOSPHERE -
CONSTANT
VOLUME AND ENERGY FLUXING
THE FOLLOWING OPTIONS WERE DEFINED BY PLANK.

ATMOS	=	5
BURN	=	0
CODE	=	1
DIMEN	=	2
EOS	=	6
GEOM	=	2
HOT	=	0
IMAX	=	20
ISLAND	=	0
JMAX	=	40
KMAX	=	1
LBUFA	=	0
LBUFB	=	0
MAGFLD	=	0
METHOD	=	2
MH	=	20
MHIC	=	1600
MM	=	3
MOP	=	1000
MHIST	=	6
MPLPB	=	2
MPP	=	3
MROWPB	=	4
MSTM	=	16
MVARST	=	16
RAD	=	0
REZONE	=	1
STRESS	=	1
SURF	=	0
SW	=	6
SWX	=	0
VISC	=	0
LAMB	=	0
BBOUND	=	0

LBOUND	=	0
KEEL	=	0
PULL	=	0
VOIDS	=	0
FLUXER	=	3
DEPOS	=	0
FAIL	=	0
STRAIN	=	1
WORK	=	0
FIREIN	=	0
MAT	=	3
AIR	=	1
FE	=	2
CONCRT	=	3

OUT

THE FOLLOWING OPTIONS WERE SPECIFIED WHEN EXECUTIVE PROCESSING BEGAN

INST	=	6
PRG	=	0
PLANK	=	0
PULL	=	0
KEEL	=	1
LIBRARY	=	0
ATMOS	=	5
BURN	=	0
CODE	=	1
DIMEN	=	2
EOS	=	6
GEOM	=	2
HO	=	0
IMAX	=	20
ISLAND	=	0
JMAX	=	40
KMAX	=	1
LBUFA	=	0
LBUFB	=	0
MAGFLD	=	0
METHOD	=	2
MH	=	20
MHIC	=	1600
MM	=	3
MOP	=	1000
MHIST	=	6
MPLPB	=	2
MPP	=	3
MROWPB	=	P 4
MSTM	=	16
MVARST	=	16
RAD	=	0
REZONE	=	1
STRESS	=	1
SURF	=	0
SW	=	6
SWX	=	0
VISC	=	0
LAMB	=	0
BBOUND	=	0
LBOUND	=	0
VOIDS	=	0
FLUXER	=	3
DEPOS	=	0
FAIL	=	0
STRAIN	=	1
WORK	=	0
FIREIN	=	0

```
MAT      =          5
AIR      =          1
FE       =          2
CONCRT   =          3


THE FOLLOWING DEFINITIONS OR REDEFINITIONS WERE MADE DURING EXECUTIVE PROC=jj==ZN=

SYS      =        370
VER      =          1
OBJLIB   =          1
TAPELIB  =          0
CDC      =          0
IBM      =          1
HX       =          0
CW       =          8
NW       =          2
RDEND    =          1
CARDL    =         10
CARDO    =         80
DOUBLE   =          0
NHEC     =      16000
NBLKS    =         10
NPIC     =       3000
NPICMAX  =       3020
STRAIN   =          1
STRESS   =          1
DEBUG    =          0
FILMPR=  =          0
D$NAMEA  =         21
D$NAMEB  =         12
D$NAMEB  =         13
D$NAMEB  =         15
D$NAMEB  =         17
D$NAMEC  =         14
D$NAMEC  =         15
D$NAMEC  =         16
D$NAMED  =          5
AIREOS   =          1


   6489 CARDS GENERATED
END OF NORMAL   RUN
 SYSTEM HULL    , VERSION        105
 CREATED 19MAY78

OUT
```

```
KEEL OUTPUT
STEEL PENETRATOR INTO CONCRETE                                          00002280
ZBLK
    PROB          1.29999923706055D+00      4114CCCC00000000
    ATMOS         5.00000000000000D+00      4150000000000000
    BREF          0.0                       0000000000000000
    CODE          1.00000000000000D+00      4110000000000000
    COLD          0.00000514755759D-79      0000000100000000
    CYCLE         0.0                   P   0000000000000000
    DIMEN         2.00000000000000D+00      4120000000000000
    DT            1.00000008274037D-08      3A2AF31E00000000
    ELC           0.0                       0000000000000000
    EOS           6.00000000000000D+00      4160000000000000
    ETH           0.0                       0000000000000000
    EXPAND        5.00000007450581D-02      3FCCCCCD00000000
    FAIL          0.0                       0000000000000000
   FLUXER        3.00000000000000D+00      4130000000000000
    GEOM          2.00000000000000D+00      4120000000000000
    IMAX          2.00000000000000D+01      4214000000000000
    IQ            1.90000000000000D+01      4213000000000000
    ISLAND        0.0                       0000000000000000
    JMAX          4.00000000000000D+01      4228000000000000
    JQ            3.90000000000000D+01      4227000000000000
    MOB           0.0                       0000000000000000
    LREF          0.00000514755759D-79      0000000100000000
    Y=         2.00000000000000D+00      4120000000000000
    MLC           0.0                       0000000000000000
    MTH           0.0                       0000000000000000
    NH            2.00000000000000D+01      4214000000000000
    NHIC          1.60000000000000D+03      4364000000000000
    NHIST         6.00000000000000D+00      4160000000000000
    NM            3.00000000000000D+00      4130000000000000
    NOP           0.0                       0000000000000000
    NPP           3.00000000000000D+00      4130000000000000
    NROWPB        4.00000000000000D+00      4140000000000000
    NSTN          0.0                       0000000000000000
    NVARST        1.60000000000000D+01      4210000000000000
    PTSTOP        6.00000000000000D+02      4325800000000000
    RADLOS        0.0                       0000000000000000
    REZONE        1.00000000000000D+00      4110000000000000
    RREF          0.0                       0000000000000000
    STABF         5.00000000000000D-01      4080000000000000
    STRAIN        1.00000000000000D+00      4110000000000000
    STRESS        1.00000000000000D+00      4110000000000000
    SUME          0.0                       0000000000000000
    T             0.0                       0000000000000000
    TERAD         0.0                       0000000000C90000
    TLC           0.0                       0000000000000000
    TREF          0.0                       0000000000000000
```

TTIME	0.0	0000000000000000
TTSTOP	1.000000000000000D+02	4264000000000000
UREZ	1.000000000000000D+01	41A0000000000000
VISC	0.0	0000000000000000
VREZ	1.000000000000000D+01	41A0000000000000
VOIDS	0.0	0000000000000000
WORK	0.0	0000000000000000
X1	4.000000000000000D+00	4140000000000000
X2	-1.000000000000000D+00	C110000000000000
XOB	0.0	0000000000000000
Y1	8.000000000000000D+00	4180000000000000
Y2	3.200000000000000D+01	4220000000000000
YGND	0.0	0000000000000000
YIELD	0.0	0000000000000000
AIR	1.000000000000000D+00	4110000000000000
FE	2.000000000000000D+00	4120000000000000
CONCRT	3.000000000000000D+00	4130000000000000

MESH INCREMENTS AND COORDINATES

I	DX	X	I	DX	X	I	DX	X
X0= 0.0								
1	5.00000000E-01	5.00000000E-01	2	5.00000000E-01	1.00000000E+00	3	5.00000000E-01	1.50000000E+00
4	5.00000000E-01	2.00000000E+00	5	5.00000000E-01	2.50000000E+00	6	5.00000000E-01	3.00000000E+00
7	5.00000000E-01	3.50000000E+00	8	5.00000000E-01	4.00000000E+00	9	5.00000000E-01	4.50000000E+00
10	5.00000000E-01	5.00000000E+00	11	5.00000000E-01	5.50000000E+00	12	5.00000000E-01	6.00000000E+00
13	5.00000000E-01	6.50000000E+00	14	5.00000000E-01	7.00000000E+00	15	5.00000000E-01	7.50000000E+00
16	5.00000000E-01	8.00000000E+00	17	5.00000000E-01	8.50000000E+00	18	5.00000000E-01	9.00000000E+00
19	5.00000000E-01	9.50000000E+00	20	5.00000000E-01	1.00000000E+01			
J	DY	Y	J	DY	Y	J	DY	Y
Y0= -1.00000010E+01								
1	5.00000000E-01	-9.50000095E+00	2	5.00000000E-01	-9.00000095E+00	3	5.00000000E-01	-8.50000095E+00
4	5.00000000E-01	-8.00000095E+00	5	5.00000000E-01	-7.50000095E+00	6	5.00000000E-01	-7.00000095E+00
7	5.00000000E-01	-6.50000095E+00	8	5.00000000E-01	-6.00000095E+00	9	5.00000000E-01	-5.50000095E+00
10	5.00000000E-01	-5.00000095E+00	11	5.00000000E-01	-4.50000095E+00	12	5.00000000E-01	-4.00000095E+00
13	5.00000000E-01	-3.50000095E+00	14	5.00000000E-01	-3.00000095E+00	15	5.00000000E-01	-2.50000095E+00
16	5.00000000E-01	-2.00000095E+00	17	5.00000000E-01	-1.50000095E+00	18	5.00000000E-01	-1.00000095E+00
19	5.00000000E-01	-5.00000954E-01	20	5.00000000E-01	-9.53674316E-07	21	5.00000000E-01	4.99999046E-01
22	5.00000000E-01	9.99999046E-01	23	5.00000000E-01	1.49999905E+00	24	5.00000000E-01	1.99999905E+00
25	5.00000000E-01	2.49999905E+00	26	5.00000000E-01	2.99999905E+00	27	5.00000000E-01	3.49999905E+00
28	5.00000000E-01	3.99999905E+00	29	5.00000000E-01	4.49999905E+00	30	5.00000000E-01	4.99999905E+00
31	5.00000000E-01	5.49999905E+00	32	5.00000000E-01	5.99999905E+00	33	5.00000000E-01	6.49999905E+00
34	5.00000000E-01	6.99999905E+00	35	5.00000000E-01	7.49999905E+00	36	5.00000000E-01	7.99999905E+00
37	5.00000000E-01	8.49999905E+00	38	5.00000000E-01	8.99999905E+00	39	5.00000000E-01	9.49999905E+00
40	5.00000000E-01	9.99999905E+00						

GENERATING PROBLEM 1.3000

DEFAULT WILL BE

GENERATE A CIRCLE OF MATERIAL 1

XC = 0.0 YC = 0.0 RADIUS = 0.0

AIR = 1

GENERATE A RECTANGL OF MATERIAL 1

X1 = 0.0 X2 = 1.0000000E+01 Y1 = -1.0000001E+01 Y2 = 0.0

```
    DELETE A   RECTANGL
         X1 =  0.0           X2 =  1.0000000E+00 Y1 = -8.0000010E+00 Y2 =  0.0
     3.816498E+00 GMS   7.800115E+09 ERGS INSERTED AS MATERIAL  1


    FE      = 2
GENERATE A RECTANGL OF MATERIAL  2
         X1 =  0.0           X2 =  1.0000000E+00 Y1 = -8.0000010E+00 Y2 =  0.0
     1.975430E+02 GMS   5.759959E+13 ERGS INSERTED AS MATERIAL  2


    CONCRT  = 3
GENERATE A RECTANGL OF MATERIAL  3
         X1 =  0.0           X2 =  1.0000000E+01 Y1 =  0.0           Y2 =  9.9999990E+00
     6.908410E+03 GMS   5.396512E+12 ERGS INSERTED AS MATERIAL  3


LOCATIONS OF STATIONS GENERATED ARE ...

         STATION    1 XP =  0.0          YP = -8.000001E+00
         STATION    2 XP =  0.0          YP = -7.000001E+00
         STATION    3 XP =  0.0          YP = -5.000001E+00
         STATION    4 XP =  0.0          YP = -3.000001E+00
         STATION    5 XP =  0.0          YP = -1.000000E+00
         STATION    6 XP =  0.0          YP =  0.0
         STATION    7 XP =  0.0          YP =  5.000001E-01
         STATION    8 XP =  0.0          YP =  1.000000E+00
         STATION    9 XP =  0.0          YP =  2.000001E+00
         STATION   10 XP =  0.0          YP =  3.000001E+00
         STATION   11 XP =  0.0          YP =  4.000001E+00
         STATION   12 XP =  0.0          YP =  5.000001E+00
         STATION   13 XP =  0.0          YP =  6.000001E+00
         STATION   14 XP =  0.0          YP =  7.000001E+00
         STATION   15 XP =  0.0          YP =  8.000001E+00
         STATION   16 XP =  0.0          YP =  9.000001E+00
         0 PARTICLES AND    16 STATIONS GENERATED
ZBLK
    PROB          1.29999923706055D+00      4114CCCC00000000
    ATMOS         5.00000000000000D+00      4150000000000000
    BREF          0.0                       0000000000000000
$HASP165 JOB  153  AF2001H ENDED CN(00)
    CODE          1.00000000000000D+00      4110000000000000
    COLD          0.00000514755759D-79      0000000100000000
    CYCLE         0.0                       0000000000000000
    DIMEN         2.00000000000000D+00      4120000000000000
    DT            1.00000008274037D-08      3A2AF31E00000000
    ELC     =     0.0                       0000000000000000
    EOS           6.00000000000000D+00      4160000000000000
    ETH           0.0                       0000000000000000
    EXPAND        5.00000007450581D-02      3FCCCCCD00000000
```

FAIL	0.0	0000000000000000
FLUXER	3.000000000000000D+00	4130000000000000
GEOM	2.000000000000000D+00	4120000000000000
IMAX	2.000000000000000D+01	4214000000000000
IQ	1.900000000000000D+01	4213000000000000
ISLAND	0.0	0000000000000000
JMAX	4.000000000000000D+01	4228000000000000
JQ	3.900000000000000D+01	4227000000000000
HOB	0.0	0000000000000000
LREF	0.000005147557590-79	0000000100000000
METHOD	2.000000000000000D+00	4120000000000000
MLC	0.0	0000000000000000
MTH	0.0	0000000000000000
NH	2.000000000000000D+01	4214000000000000
NHIC	1.600000000000000D+03	4364000000000000
NHIST	6.000000000000000D+00	4160000000000000
NM	3.000000000000000D+00	4130000000000000
NOP	1.600000000000000D+01	4210000000000000
NPP	3.000000000000000D+00	4130000000000000
NROWPB	4.000000000000000D+00	4140000000000000
NSTN	1.600000000000000D+01	4210000000000000
NVARST	1.600000000000000D+01	4210000000000000
PTSTOP	6.000000000000000D+02	4325800000000000
RADLOS	0.0	0000000000000000
REZONE	1.000000000000000D+00	4110000000000000
RREF	0.0	0000000000000000
STABF	5.000000000000000D-01	4080000000000000
STRAIN	1.000000000000000D+00	4110000000000000
STRESS	1.000000000000000D+00	4110000000000000
SUME	0.0	0000000000000000
T	0.0	0000000000000000
TERAD	0.0	0000000000000000
TLC	0.0	0000000000000000
TREF	0.0	0000000000000000
TTIME	0.0	0000000000000000
TTSTOP	1.000000000000000D+02	4264000000000000
UREZ	1.000000000000000D+01	41A0000000000000
VISC	0.0	0000000000000000
VREZ	1.000000000000000D+01	41A0000000000000
VOIDS	0.0	0000000000000000
WORK	0.0	0000000000000000
X1	4.000000000000000D+00	4140000000000000
X2	-1.000000000000000D+00	C110000000000000
XOB	0.0	0000000000000000
Y1	8.000000000000000D+00	4180000000000000
Y2	3.200000000000000D+01	4220000000000000
YGND	0.0	0000000000000000
YIELD	0.0	0000000000000000
AIR	1.000000000000000D+00	4110000000000000
FE	2.000000000000000D+00	4120000000000000
CONCRT	3.000000000000000D+00	4130000000000000

CHECKING STATION LOCATIONS.

INDIVIDUAL MASS SUMS
3.817519E+00 1.975430E+02 6.911145E+03

I= 1 X(I)= 0.500 DX(I)= 0.500

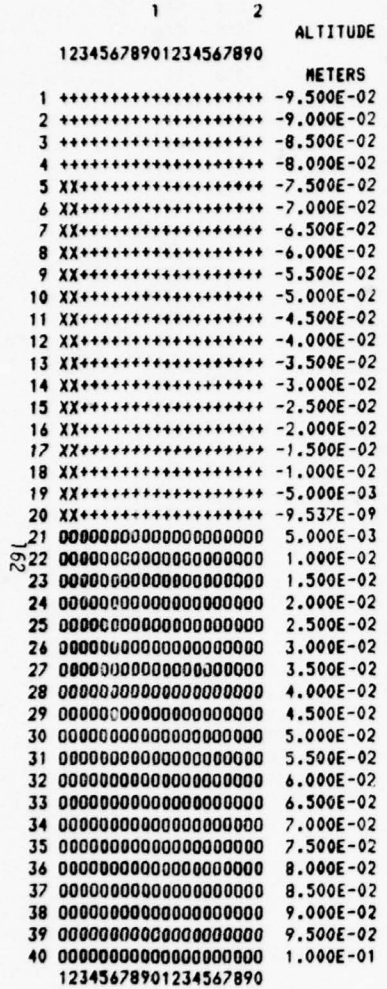
J	U	V	AIX	RHO	AMX	DY	Y
1	0.0	0.0	2.04400205E+09	1.22499699E-03	4.81055118E-04	5.00000000E-01	-9.50000095E+00
2	0.0	0.0	2.04400205E+09	1.22499699E-03	4.81055118E-04	5.00000000E-01	-9.00000095E+00
3	0.0	0.0	2.04400205E+09	1.22499699E-03	4.81055118E-04	5.00000000E-01	-8.50000095E+00
4	0.0	0.0	2.04400205E+09	1.22499699E-03	4.81055118E-04	5.00000000E-01	-8.00000095E+00
5	0.0	7.62000312E+05	1.26792499E+09	7.85998631E+00	3.08660889E+00	5.00000000E-01	-7.50000095E+00
6	0.0	7.62000312E+05	1.26792499E+09	7.85998631E+00	3.08660889E+00	5.00000000■■	-7.00000095E+00
7	0.0	7.62000312E+05	1.26792499E+09	7.85998631E+00	3.08660889E+00	5.00000000E-01	-6.50000095E+00
8	0.0	7.62000312E+05	1.26792499E+09	7.85998631E+00	3.08660889E+00	5.00000000E-01	-6.00000095E+00
9	0.0	7.62000312E+05	1.26792499E+09	7.85998631E+00	3.08660889E+00	5.00000000E-01	-5.50000095E+00
10	0.0	7.62000312E+05	1.26792499E+09	7.85998631E+00	3.08660889E+00	5.00000000E-01	-5.00000095E+00
11	0.0	7.62000312E+05	1.26792499E+09	7.85998631E+00	3.08660889E+00	5.00000000E-01	-4.50000095E+00
12	0.0	7.62000312E+05	1.26792499E+09	7.85998631E+00	3.08660889E+00	5.00000000E-01	-4.00000095E+00
13	0.0	7.62000312E+05	1.26792499E+09	7.85998631E+00	3.08660889E+00	5.00000000E-01	-3.50000095E+00
14	0.0	7.62000312E+05	1.26792499E+09	7.85998631E+00	3.08660889E+00	5.00000000E-01	-3.00000095E+00
15	0.0	7.62000312E+05	1.26792499E+09	7.85998631E+00	3.08660889E+00	5.00000000E-01	-2.50000095E+00
16	0.0	7.62000312E+05	1.26792499E+09	7.85998631E+00	3.08660889E+00	5.00000000E-01	-2.00000095E+00
17	0.0	7.62000312E+05	1.26792499E+09	7.85998631E+00	3.08660889E+00	5.00000000E-01	-1.50000095E+00
18	0.0	7.62000312E+05	1.26792499E+09	7.85998631E+00	3.08660889E+00	5.00000000E-01	-1.00000095E+00
19	0.0	7.62000312E+05	1.26792499E+09	7.85998631E+00	3.08660889E+00	5.00000000E-01	-5.00000954E-01
20	0.0	7.62000312E+05	1.26792499E+09	7.85998631E+00	3.08660889E+00	5.00000000E-01	-9.53674316E-07
21	0.0	0.0	7.80999168E+08	2.19999695E+00	8.63936663E-01	5.00000000E-01	4.99999046E-01
22	0.0	0.0	7.80999168E+08	2.19999695E+00	8.63936663E-01	5.00000000E-01	9.99999046E-01
23	0.0	0.0	7.80999168E+08	2.19999695E+00	8.63936663E-01	5.00000000E-01	1.49999905E+00
24	0.0	0.0	7.80999168E+08	2.19999695E+00	8.63936663E-01	5.00000000E-01	1.99999905E+00
25	0.0	0.0	7.80999168E+08	2.19999695E+00	8.63936663E-01	5.00000000E-01	2.49999905E+00
26	0.0	0.0	7.80999168E+08	2.19999695E+00	8.63936663E-01	5.00000000E-01	2.99999905E+00
27	0.0	0.0	7.80999168E+08	2.19999695E+00	8.63936663E-01	5.00000000E-01	3.49999905E+00
28	0.0	0.0	7.80999168E+08	2.■9999695E+00	8.63936663E-01	5.00000000E-01	3.99999905E+00
29	0.0	0.0	7.80999168E+08	2.19999695E+00	8.63936663E-01	5.00000000E-01	4.49999905E+00
30	0.0	0.0	7.80999168E+08	2.19999695E+00	8.63936663E-01	5.00000000E-01	4.99999905E+00
31	0.0	0.0	7.80999168E+08	2.19999695E+00	8.63936663E-01	5.00000000E-01	5.49999905E+00
32	0.0	0.0	7.80999168E+08	2.19999695E+00	8.63936663E-01	5.00000000E-01	5.99999905E+00
33	0.0	0.0	7.80999168E+08	2.19999695E+00	8.63936663E-01	5.00000000E-01	6.49999905E+00
34	0.0	0.0	7.80999168E+08	2.19999695E+00	8.63936663E-01	5.00000000E-01	6.99999905E+00
35	0.0	0.0	7.80999168E+08	2.19999695E+00	8.63936663E-01	5.00000000E-01	7.49999905E+00
36	0.0	0.0	7.80999168E+08	2.19999695E+00	8.63936663E-01	5.00000000E-01	7.99999905E+00
37	■■■0	0.0	7.80999168E+08	2.19999695E+00	8.63936663E-01	5.00000000E-01	8.49999905E+00

38	0.0	0.0	7.80999168E+08	2.19999695E+00	8.63936663E-01	5.00000000E-01	8.99999905E+00
39	0.0	0.0	7.80999168E+08	2.19999695E+00	8.63936663E-01	5.00000000E-01	9.49999905E+00
40	0.0	0.0	7.80999168E+08	2.19999695E+00	8.63936663E-01	5.00000000E-01	9.99999905E+00

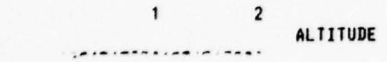
MATERIAL MASSES

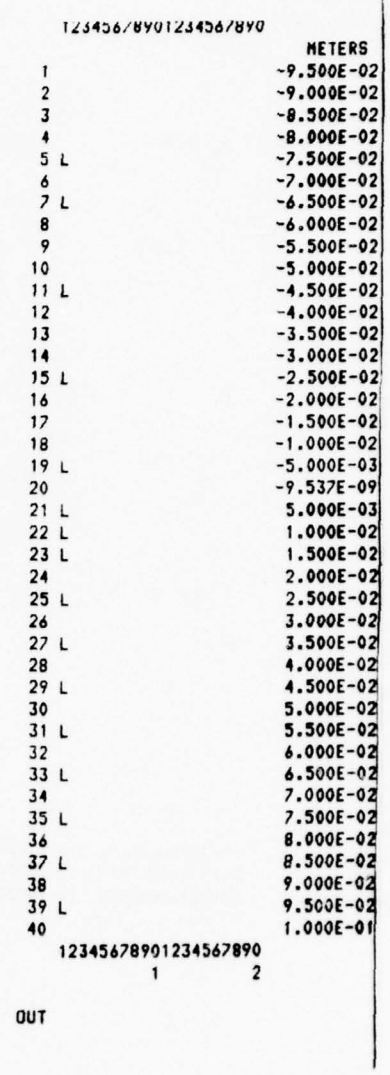
J	1	2	3
1	4.81055118E-04	0.0	0.0
2	4.81055118E-04	0.0	0.0
3	4.81055118E-04	0.0	0.0
4	4.81055118E-04	0.0	0.0
5	0.0	3.08660889E+00	0.0
6	0.0	3.08660889E+00	0.0
7	0.0	3.08660889E+00	0.0
8	0.0	3.08660889E+00	0.0
9	0.0	3.08660889E+00	0.0
10	0.0	3.08660889E+00	0.0
11	0.0	3.08660889E+00	0.0
12	0.0	3.08660889E+00	0.0
13	0.0	3.08660889E+00	0.0
14	0.0	3.08660889E+00	0.0
15	0.0	3.08660889E+00	0.0
16	0.0	3.08660889E+00	0.0
17	0.0	3.08660889E+00	0.0
18	0.0	3.08660889E+00	0.0
19	0.0	3.08660889E+00	0.0
20	0.0	3.08660889E+00	0.0
21	0.0	0.0	8.63936663E-01
22	0.0	0.0	8.63936663E-01
23	0.0	0.0	8.63936663E-01
24	0.0	0.0	8.63936663E-01
25	0.0	0.0	8.63936663E-01
26	0.0	0.0	8.63936663E-01
27	0.0	0.0	8.63936663E-01
28	0.0	0.0	8.63936663E-01
29	0.0	0.0	8.63936663E-01
30	0.0	0.0	8.63936663E-01
31	0.0	0.0	8.63936663E-01
32	0.0	0.0	8.63936663E-01
33	0.0	0.0	8.63936663E-01
34	0.0	0.0	8.63936663E-01
35	0.0	0.0	8.63936663E-01
36	0.0	0.0	8.63936663E-01
37	0.0	0.0	8.63936663E-01
38	0.0	0.0	8.63936663E-01
39	0.0	0.0	8.63936663E-01
40	0.0	0.0	8.63936663E-01

MATERIAL MAP
(1- 20)



STATIONS/DUST/PARTICLES
(1- 20)





OUT

PROBLEM 1.3 CYBER 176 KEEL RUN

```
BATCH       CREATED 08/16/78  TODAY IS 08/16/78
  AUTOMATIC BULLETIN TO BATCH JOBS
+
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	SYSBULL	CONTENTS
8/16/78	STATUS	AVAILABILITY STATUS OF ALL SYSTEMS
8/ 9/78	MEMMGT	CM AND ECS FIELD MANAGEMENT
7/31/78	NASTRAN	INFORMATION FOR USERS OF NASTRAN
7/18/78	CONTACT	WHO TO CONTACT ABOUT COMPUTER PROBLEMS
7/14/78	MODS	FEATURES ADDED TO CDC NOS/BE
7/14/78	CMECMGT	CM AND ECS FIELD LENGTH MANAGEMENT
6/23/78	FLECS	STRUCTURED PROGRAMMING PRE-PROCESSOR FOR FTN
6/20/78	LETTER	AFWL COMPUTER CENTER NEWSLETTER
6/14/78	ASPLIB	AFWL COMMON MATH LIBRARIES
5/16/78	CLASS	CLASSES FOR USERS OF AFWL COMPUTER CENTER
5/ 8/78	ACCESS	HOW TO OBTAIN AN AFWL/KAFB COMPUTER ACCOUNT
5/ 4/78	CONFIG	SYSTEMS CONFIGURATION
5/ 4/78	EXPDITE	AFWR CUSTOMER SERVICE (EXPEDITOR)
5/ 1/79	PRIORTY	JOB CARD PRIORITY CODES
4/24/78	BILLING	AFWL COMPUTER BILLING INFORMATION
4/21/78	DIALUP	COMPUTER DIALUP PHONE NUMBERS
4/19/78	INTRO	BASIC INTRODUCTION TO KAFB COMPUTER CENTER
4/18/78	DUMPS	STANDARD PROCEDURES FOR ERROR DUMPS
4/14/78	TITLE	MICROFICHE VISUAL TITLE GENERATION
4/11/78	REQUEST	STANDARD PROCEDURES FOR REQUESTING TAPES
4/ 6/78	PLOT	DEVICE INDEPENDENT PLOT SYSTEM -METAPLOT-
3/31/78	ACCOUNT	ACCOUNT CARD FORMAT.
3/30/78	PFRULES	LOCAL RULES FOR CATALOGING FILES
3/30/78	BACKUP	PERMANENT FILE BACKUP PROCEDURES
3/30/78	PRMFILE	PERM FILE ACCOUNTING AND BACKUP SYSTEMS
3/ 9/78	LABEL	AFWL LABELLED TAPE PROCESSING
3/ 9/78	FR80	200 SIMULATION VIA FR80
3/ 9/78	COMPILE	FTN COMPILER CHANGES AND RELEASES
3/ 8/78	AFSCNET	INFORMATION ABOUT AFSCNET
3/ 7/78	METAQUE	AUTOMATIC DISPOSITION OF META PLOT FILES
2/10/78	SWITCH	NEW INTERCOM PHONE SWITCH
1/17/78	DIFFER	DIFFERENCES IN NOS/BE FROM 6600 TO CYBER 176
1/ 4/78	DISSTIP	DISSPLA TECH. INFO. PROGRAMMING SUGGESTIONS
10/ 3/77	DISSFLA	A NEW USER ORIENTED PLOTING PACKAGE

SYSTEM WARNINGS

8/16/78	BUDGETARY CONSIDERATION FOR FY /9: 176 CHARGES WILL GO UP BY ABOUT 15%.
8/16/78	REVIEW, SIGN AND RETURN TAPE INVENTORY LISTINGS BEFORE 21 AUGUST 1978.
8/16/78	+++++ FLASH MESSAGE +++++ CYBER RECORD MANAGER ANALYSIS CLASS HAS BEEN
8/16/78	+++++ CHANGED TO AUG 28-30. ALL CLASS MEMBERS TAKE NOTE ++++ FLASH +++
8/16/78	** NOTICE TO CONTRACTORS ** CONTRACTOR WORK AREA IN ROOM 110 OF BLDG
8/16/78	412 WILL NOT BE AVAILABLE AFTER 28 AUG 78. THIS WILL BE THE NEW
8/16/78	PCAM AREA. PLEASE REMOVE ALL LISTINGS OR CARD DECKS STORED THERE.
8/16/78	

PROB 1.3000 IS NOT ON THE LIBTAPE ON A KEEL RERUN
! WILL CONTINUE AS FOR A NORMAL FIRST RUN
+
KEEL RUN
+
+
+
+
+

EQUATION OF STATE -

SOLIDS - NO STRENGTH

ATMOSPHERE -

CONSTANT

VOLUME AND ENERGY FLUXING

THE FOLLOWING OPTIONS WERE DEFINED BY PLANK.

ATMOS	=	5
BURN	=	0
CODE	=	1
DIMEN	=	2
EOS	=	6
GEOM	=	2
HOT	=	0
IMAX	=	20
ISLAND	=	0
JMAX	=	40
KMAX	=	1
LBUFA	=	0
LBUFB	=	0
MAGFLD	=	0
METHOD	=	2
NH	=	20
NHIC	=	1600
NM	=	3
NOP	=	1000
NHIST	=	6
NPLPB	=	2
NPP	=	2
NROWPB	=	4
NSTN	=	16
NVARST	=	15
RAD	=	0
REZONE	=	1
STRESS	=	1
SURF	=	0
SW	=	0
SWX	=	1
VISC	=	0
LAMB	=	0
BBOUND	=	0
LBOUND	=	0
KEEL	=	0
PULL	=	0
VOIDS	=	0
FLUXER	=	3
DEPOS	=	0
FAIL	=	0
STRAIN	=	1
WORK	=	0
FIREIN	=	0
MAT	=	3
AIR	=	1
FE	=	2
CONCRT	=	3

THE FOLLOWING OPTIONS WERE SPECIFIED WHEN EXECUTIVE PROCESSING BEGAN

INST	=	1
PRG	=	0
PLANK	=	0
PULL	=	0
KEEL	=	1
LIBRARY	=	0
ATMOS	=	5
BURN	=	0
CODE	=	1
DIMEN	=	2
EOS	=	6
GEOM	=	2
HOT	=	0
IMAX	=	20
ISLAND	=	0
JMAX	=	40
KMAX	=	1
LBUFA	=	0
LBUFB	=	0
MAGFLD	=	0
METHOD	=	2
NH	=	20
NHIC	=	1600
NM	=	3
NOP	=	1000
NHIST	=	6
NPLPB	=	2
NPP	=	2
NROWPB	=	4
NSTN	=	16
NVARST	=	15
RAD	=	0
REZONE	=	1
STRESS	=	1
SURF	=	0
SW	=	0
SWX	=	1
VISC	=	0
LAMD	=	0
BBOUND	=	0
LBOUND	=	0
VOIDS	=	0
FLUXER	=	3
DEPOS	=	0
FAIL	=	0
STRAIN	=	1
WORK	=	0
FIREIN	=	0
MAT	=	3
AIR	=	1
FE	=	2
CONCRT	=	3

+

```
+
THE FOLLOWING DEFINITIONS OR REDEFINITIONS WERE MADE DURING EXECUTIVE PROCESSING
+
+
SYS       =         176
VER       =           4
NOSBE     =           1
PF        =           1
ECS       =           1
OBJLIB    =           1
TAPELIB   =           4
ROUTE     =           1
DENSHUL   =           5
DENSLIB   =           5
DENSSTA   =           3
LABEL     =           1
DATE      =           1
CONTROL   =           1
CDC       =           1
IBM       =           0
CW        =          10
NW        =           1
RDEND     =           2
CARDL     =           8
CARDU     =          80
NHEC      =       16000
NBLKS     =          10
NPIC      =        2000
NPICMAX   =        3020
STRAIN    =           1
STRESS    =           1
DEBUG     =           0
FILMPR    =           1
HLEV      =           1
D$NAMEA   =          21
D$NAMEB   =          12
D$NAMEB   =          13
D$NAMEB   =          15
D$NAMEB   =          17
D$NAMEC   =          14
D$NAMEC   =          15
D$NAMEC   =          16
D$NAMEC   =          18
D$NAMED   =           5
AIREOS    =           1
IMIN      =         250
JMIN      =         250
NHIN      =        5000
```

KEEL OUTPUT

STEEL PENETRATOR INTO CONCRETE

ZBLK

PROB	1.300000000000000E-00	1720514631463146314
ATMOS	5.000000000000000E+00	1722500000000000000
DREF	0.	0000000000000000000
CODE	1.000000000000000E+00	1720400000000000000
COLD	0.	7777777777777777776
CYCLE	0.	0000000000000000000
DIMEN	2.000000000000000E+00	1721400000000000000
DT	1.000000000000000E-00	1665527451670430214
ELC	0.	0000000000000000000
EOS	6.000000000000000E+00	1722600000000000000
ETH	0.	0000000000000000000
EXPAND	5.000000000000000E-02	1713631463146314631
FAIL	0.	0000000000000000000
FLUXER	3.000000000000000E+00	1721600000000000000
GEOM	2.000000000000000E+00	1721400000000000000
IMAX	2.000000000000000E+01	1724500000000000000
IQ	1.900000000000000E+01	1724460000000000000
ISLAND	0.	0000000000000000000
JMAX	4.000000000000000E+01	1725500000000000000
JQ	3.900000000000000E+01	1725470000000000000
HOB	0.	0000000000000000000
LREF	0.	7777777777777777776
METHOD	2.000000000000000E+00	1721400000000000000
MLC	0.	0000000000000000000
MTH	0.	0000000000000000000
NH	2.000000000000000E+01	1724500000000000000
NHIC	1.600000000000000E+03	1732620000000000000
NHIST	6.000000000000000E+00	1722600000000000000
NM	3.000000000000000E+00	1721600000000000000
NOP	0.	0000000000000000000
NPP	2.000000000000000E+00	1721400000000000000
NROWPB	4.000000000000000E+00	1722400000000000000
NSTN	0.	0000000000000000000
NVARST	1.300000000000000E+01	1723740000000000000
PTSTOP	6.000000000000000E+02	1731540000000000000
RADLOS	0.	0000000000000000000
REZONE	1.000000000000000E+00	1720400000000000000
RREF	0.	0000000000000000000
STABF	5.000000000000000E-01	1717400000000000000
STRAIN	1.000000000000000E+00	1720400000000000000
STRESS	1.000000000000000E+00	1720400000000000000
SUME	0.	0000000000000000000
T	0.	0000000000000000000
TERAD	0.	0000000000000000000
TLC	0.	0000000000000000000
TREF	0.	0000000000000000000
TTIME	0.	0000000000000000000
TTIME6	0.	0000000000000000000
TTIME7	0.	0000000000000000000

TTSTOP	1.000000000000000E+02	1726620000000000000
UREZ	1.000000000000000E+01	1723500000000000000
VISC	0.	0000000000000000000
VREZ	1.000000000000000E+01	1723500000000000000
VOIDS	0.	0000000000000000000
WORK	0.	0000000000000000000
X1	4.000000000000000E+00	1722400000000000000
X2	-1.000000000000000E+00	6057377777777777777
XOB	0.	0000000000000000000
Y1	0.000000000000000E+00	1723400000000000000
Y2	3.200000000000000E+01	1725420000000000000
YGND	0.	0000000000000000000
YIELD	0.	0000000000000000000
AIR	1.000000000000000E+00	1720400000000000000
FE	2.000000000000000E+00	1721400000000000000
CONCRT	3.000000000000000E+00	1721600000000000000

MESH INCREMENTS AND COORDINATES

I	DX	X	I	DX	X	I	DX	X
X0= 0.								
1	5.00000000E-01	5.00000000E-01	2	5.00000000E-01	1.00000000E+00	3	5.00000000E-01	1.50000000E+00
4	5.00000000E-01	2.00000000E+00	5	5.00000000E-01	2.50000000E+00	6	5.00000000E-01	3.00000000E+00
7	5.00000000E-01	3.50000000E+00	8	5.00000000E-01	4.00000000E+00	9	5.00000000E-01	4.50000000E+00
10	5.00000000E-01	5.00000000E+00	11	5.00000000E-01	5.50000000E+00	12	5.00000000E-01	6.00000000E+00
13	5.00000000E-01	6.50000000E+00	14	5.00000000E-01	7.00000000E+00	15	5.00000000E-01	7.50000000E+00
16	5.00000000E-01	8.00000000E+00	17	5.00000000E-01	8.50000000E+00	18	5.00000000E-01	9.00000000E+00
19	5.00000000E-01	9.50000000E+00	20	5.00000000E-01	1.00000000E+01			

J	DY	Y	J	DY	Y	J	DY	Y
Y0= -1.00000000E+01								
1	5.00000000E-01	-9.50000000E+00	2	5.00000000E-01	-9.00000000E+00	3	5.00000000E-01	-8.50000000E+00
4	5.00000000E-01	-8.00000000E+00	5	5.00000000E-01	-7.50000000E+00	6	5.00000000E-01	-7.00000000E+00
7	5.00000000E-01	-6.50000000E+00	8	5.00000000E-01	-6.00000000E+00	9	5.00000000E-01	-5.50000000E+00
10	5.00000000E-01	-5.00000000E+00	11	5.00000000E-01	-4.50000000E+00	12	5.00000000E-01	-4.00000000E+00
13	5.00000000E-01	-3.50000000E+00	14	5.00000000E-01	-3.00000000E+00	15	5.00000000E-01	-2.50000000E+00
16	5.00000000E-01	-2.00000000E+00	17	5.00000000E-01	-1.50000000E+00	18	5.00000000E-01	-1.00000000E+00
19	5.00000000E-01	-5.00000000E-01	20	5.00000000E-01	0.	21	5.00000000E-01	5.00000000E-01
22	5.00000000E-01	1.00000000E+00	23	5.00000000E-01	1.50000000E+00	24	5.00000000E-01	2.00000000E+00
25	5.00000000E-01	2.50000000E+00	26	5.00000000E-01	3.00000000E+00	27	5.00000000E-01	3.50000000E+00
28	5.00000000E-01	4.00000000E+00	29	5.00000000E-01	4.50000000E+00	30	5.00000000E-01	5.00000000E+00
31	5.00000000E-01	5.50000000E+00	32	5.00000000E-01	6.00000000E+00	33	5.00000000E-01	6.50000000E+00
34	5.00000000E-01	7.00000000E+00	35	5.00000000E-01	7.50000000E+00	36	5.00000000E-01	8.00000000E+00
37	5.00000000E-01	8.50000000E+00	38	5.00000000E-01	9.00000000E+00	39	5.00000000E-01	9.50000000E+00
40	5.00000000E-01	1.00000000E+01						

```
       GENERATING PROBLEM    1.3000
+
  DEFAULT WILL BE
+
GENERATE A CIRCLE     OF MATERIAL  1
        XC =  0.            YC =  0.            RADIUS =  0.
+
    AIR       =  1
+
GENERATE A RECTANGLE  OF MATERIAL  1
        X1 =  0.            X2 =  1.0000000E+01 Y1 = -1.0000000E+01 Y2 =  0.
    DELETE A RECTANGLE
        X1 =  0.            X2 =  1.0000000E+00 Y1 = -8.0000000E+00 Y2 =  0.
+
     3.817603E+00 GMS   7.803304E+09 ERGS INSERTED AS MATERIAL  1
+
+
+
    FE        =  2
+
GENERATE A RECTANGLE  OF MATERIAL  2
        X1 =  0.            X2 =  1.0000000E+00 Y1 = -8.0000000E+00 Y2 =  0.
+
     1.975433E+02 GMS   5.760170E+13 ERGS INSERTED AS MATERIAL  2
+
+
+
    CONCRT    =  3
+
GENERATE A RECTANGLE  OF MATERIAL  3
        X1 =  0.            X2 =  1.0000000E+01 Y1 =  0.            Y2 =  1.0000000E+01
+
     6.911504E+03 GMS   5.397804E+12 ERGS INSERTED AS MATERIAL  3
+
+
+
LOCATIONS OF STATIONS GENERATED ARE ...
+
          STATION    1 XP =  0.          YP = -8.000000E+00
          STATION    2 XP =  0.          YP = -7.000000E+00
          STATION    3 XP =  0.          YP = -5.000000E+00
          STATION    4 XP =  0.          YP = -3.000000E+00
          STATION    5 XP =  0.          YP = -1.000000E+00
          STATION    6 XP =  0.          YP =  0.
          STATION    7 XP =  0.          YP =  5.000000E-01
          STATION    8 XP =  0.          YP =  1.000000E+00
          STATION    9 XP =  0.          YP =  2.000000E+00
          STATION   10 XP =  0.          YP =  3.000000E+00
          STATION   11 XP =  0.          YP =  4.000000E+00
          STATION   12 XP =  0.          YP =  5.000000E+00
          STATION   13 XP =  0.          YP =  6.000000E+00
          STATION   14 XP =  0.          YP =  7.000000E+00
          STATION   15 XP =  0.          YP =  8.000000E+00
          STATION   16 XP =  0.          YP =  9.000000E+00
```

```
+
        0 PARTICLES AND    16 STATIONS GENERATED
+
ZBLK
    PROB            1.300000000000000E+00     1720514631463146
    ATMOS           5.000000000000000E+00     1722500000000000000
    BREF            0.                        0000000000000000000
    CODE            1.000000000000000E+00     1720400000000000000
    COLD            0.                        7777777777777777776
    CYCLE           0.                        0000000000000000000
    DIMEN           2.000000000000000E+00     1721400000000000000
    DT              1.000000000000000E-08     1665527461670430214?
    ELC             0.                        0000000000000000000
    EOS             6.000000000000000E+00     1722600000000000000
    ETH             0.                        0000000000000000000
    EXPAND          5.000000000000000E-02     1713631463146314631?
    FAIL            0.                        0000000000000000000
    FLUXER          3.000000000000000E+00     1721600000000000000
    GEOM            2.000000000000000E+00     1721400000000000000
    IMAX            2.000000000000000E+01     1724500000000000000
    IQ              1.900000000000000E+01     1724460000000000000
    ISLAND          0.                        0000000000000000000
    JMAX            4.000000000000000E+01     1725500000000000000
    JQ              3.900000000000000E+01     1725470000000000000
    HOB             0.                        0000000000000000000
    LREF            0.                        7777777777777777776
    METHOD          2.000000000000000E+00     1721400000000000000
    MLC             0.                        0000000000000000000
    MTH             0.                        0000000000000000000
    NH              2.000000000000000E+01     1724500000000000000
    NHIC            1.600000000000000E+03     1732620000000000000
    NHIST           6.000000000000000E+00     1722600000000000000
    NM              3.000000000000000E+00     1721600000000000000
    NOP             1.600000000000000E+01     1724400000000000000
    NPP             2.000000000000000E+00     1721400000000000000
    NROWPB          4.000000000000000E+00     1722400000000000000
    NSTN            1.600000000000000E+01     1724400000000000000
    NVARST          1.500000000000000E+01     1723740000000000000
    PTSTOP          6.000000000000000E+02     1731454000000000000
    RADLOS          0.                        0000000000000000000
    REZONE          1.000000000000000E+00     1720400000000000000
    RREF            0.                        0000000000000000000
    STABF           5.000000000000000E-01     1717400000000000000
    STRAIN          1.000000000000000E+00     1720400000000000000
    STRESS          1.000000000000000E+00     1720400000000000000
    SUME            0.                        0000000000000000000
    T               0.                        0000000000000000000
    TERAD           0.                        0000000000000000000
    TLC             0.                        0000000000000000000
    TREF            0.                        0000000000000000000
    TTIME           0.                        0000000000000000000
    TTIME6          0.                        0000000000000000000
    TTIME7          0.                        0000000000000000000
    TTSTOP          1.000000000000000E+02     1726620000000000000
```

UREZ	1.00000000000000E+01	1723500000000000000
VISC	0.	0000000000000000000
VREZ	1.00000000000000E+01	1723500000000000000
VOIDS	0.	0000000000000000000
WORK	0.	0000000000000000000
X1	4.00000000000000E+00	1722400000000000000
X2	-1.00000000000000E+00	6057377777777777777
XOB	0.	0000000000000000000
Y1	8.00000000000000E+00	1723400000000000000
Y2	3.20000000000000E+01	1725400000000000000
YGND	0.	0000000000000000000
YIELD	0.	0000000000000000000
AIR	1.00000000000000E+00	1720400000000000000
FE	2.00000000000000E+00	1721400000000000000
CONCRT	3.00000000000000E+00	1721600000000000000
STAPE	1.02094870487300-196	0505364155555555 1031

CHECKING STATION LOCATIONS.
+
+
+
+

INDIVIDUAL MASS SUMS
3.817663E+00 1.975433E+02 6.911504E+03

I= 1 X(I)= .500 DX(I)= .500

J	U	V	AIX	RHO	AMX	DY	Y
1	0.	0.	2.04400000E+09	1.22500000E-03	4.81056375E-04	5.00000000E-01	-9.50000000E+00
2	0.	0.	2.04400000E+09	1.22500000E-03	4.81056375E-04	5.00000000E-01	-9.00000000E+00
3	0.	0.	2.04400000E+09	1.22500000E-03	4.81056375E-04	5.00000000E-01	-8.50000000E+00
4	0.	0.	2.04400000E+09	1.22500000E-03	4.81056375E-04	5.00000000E-01	-8.00000000E+00
5	0.	7.62000000E+05	1.26816212E+09	7.86000000E+00	3.08661478E+00	5.00000000E-01	-7.50000000E+00
6	0.	7.62000000E+05	1.26816212E+09	7.86000000E+00	3.08661478E+00	5.00000000E-01	-7.00000000E+00
7	0.	7.62000000E+05	1.26816212E+09	7.86000000E+00	3.08661478E+00	5.00000000E-01	-6.50000000E+00
8	0.	7.62000000E+05	1.26816212E+09	7.86000000E+00	3.08661478E+00	5.00000000E-01	-6.00000000E+00
9	0.	7.62000000E+05	1.26816212E+09	7.86000000E+00	3.08661478E+00	5.00000000E-01	-5.50000000E+00
10	0.	7.62000000E+05	1.26816212E+09	7.86000000E+00	3.08661478E+00	5.00000000E-01	-5.00000000E+00
11	0.	7.62000000E+05	1.26816212E+09	7.86000000E+00	3.08661478E+00	5.00000000E-01	-4.50000000E+00
12	0.	7.62000000E+05	1.26816212E+09	7.86000000E+00	3.08661478E+00	5.00000000E-01	-4.00000000E+00
13	0.	7.62000000E+05	1.26816212E+09	7.86000000E+00	3.08661478E+00	5.00000000E-01	-3.50000000E+00
14	0.	7.62000000E+05	1.26816212E+09	7.86000000E+00	3.08661478E+00	5.00000000E-01	-3.00000000E+00
15	0.	7.62000000E+05	1.26816212E+09	7.86000000E+00	3.08661478E+00	5.00000000E-01	-2.50000000E+00
16	0.	7.62000000E+05	1.26816212E+09	7.86000000E+00	3.08661478E+00	5.00000000E-01	-2.00000000E+00
17	0.	7.62000000E+05	1.26816212E+09	7.86000000E+00	3.08661478E+00	5.00000000E-01	-1.50000000E+00
18	0.	7.62000000E+05	1.26816212E+09	7.86000000E+00	3.08661478E+00	5.00000000E-01	-1.00000000E+00
19	0.	7.62000000E+05	1.26816212E+09	7.86000000E+00	3.08661478E+00	5.00000000E-01	-5.00000000E-01
20	0.	7.62000000E+05	1.26816212E+09	7.86000000E+00	3.08661478E+00	5.00000000E-01	0.
21	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	5.00000000E-01
22	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	1.00000000E+00
23	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	1.50000000E+00
24	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	2.00000000E+00
25	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	2.50000000E+00
26	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	3.00000000E+00
27	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	3.50000000E+00
28	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	4.00000000E+00
29	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	4.50000000E+00
30	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	5.00000000E+00
31	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	5.50000000E+00
32	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	6.00000000E+00
33	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	6.50000000E+00
34	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	7.00000000E+00
35	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	7.50000000E+00
36	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	8.00000000E+00
37	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	8.50000000E+00
38	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	9.00000000E+00
39	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	9.50000000E+00
40	0.	0.	7.81000000E+08	2.20000000E+00	8.63937980E-01	5.00000000E-01	1.00000000E+01

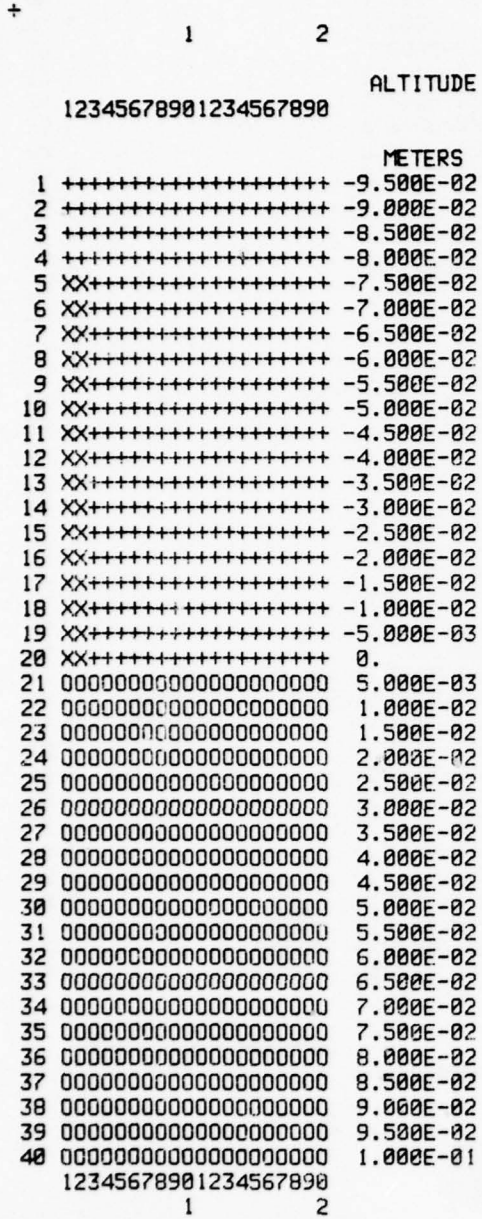
+
+

MATERIAL MASSES

+

J	1	2	3
1	4.81056375E-04	0.	0.
2	4.81056375E-04	0.	0.
3	4.81056375E-04	0.	0.
4	4.81056375E-04	0.	0.
5	0.	3.08661478E+00	0.
6	0.	3.08661478E+00	0.
7	0.	3.08661478E+00	0.
8	0.	3.08661478E+00	0.
9	0.	3.08661478E+00	0.
10	0.	3.08661478E+00	0.
11	0.	3.08661478E+00	0.
12	0.	3.08661478E+00	0.
13	0.	3.08661478E+00	0.
14	0.	3.08661478E+00	0.
15	0.	3.08661478E+00	0.
16	0.	3.08661478E+00	0.
17	0.	3.08661478E+00	0.
18	0.	3.08661478E+00	0.
19	0.	3.08661478E+00	0.
20	0.	3.08661478E+00	0.
21	0.	0.	8.63937980E-01
22	0.	0.	8.63937980E-01
23	0.	0.	8.63937980E-01
24	0.	0.	8.63937980E-01
25	0.	0.	8.63937980E-01
26	0.	0.	8.63937980E-01
27	0.	0.	8.63937980E-01
28	0.	0.	8.63937980E-01
29	0.	0.	8.63937980E-01
30	0.	0.	8.63937980E-01
31	0.	0.	8.63937980E-01
32	0.	0.	8.63937980E-01
33	0.	0.	8.63937980E-01
34	0.	0.	8.63937980E-01
35	0.	0.	8.63937980E-01
36	0.	0.	8.63937980E-01
37	0.	0.	8.63937980E-01
38	0.	0.	8.63937980E-01
39	0.	0.	8.63937980E-01
40	0.	0.	8.63937980E-01

MATERIAL MAP
(1- 20)



STATIONS/DUST/PARTICLES
(1- 20)

```
+
                1         2

                                    ALTITUDE
    12345678901234567890

                                      METERS
 1                                -9.500E-02
 2                                -9.000E-02
 3                                -8.500E-02
 4 L                              -8.000E-02
 5                                -7.500E-02
 6 L                              -7.000E-02
 7                                -6.500E-02
 8                                -6.000E-02
 9                                -5.500E-02
10 L                              -5.000E-02
11                                -4.500E-02
12                                -4.000E-02
13                                -3.500E-02
14 L                              -3.000E-02
15                                -2.500E-02
16                                -2.000E-02
17                                -1.500E-02
18 L                              -1.000E-02
19                                -5.000E-03
20                                 0.
21 L                               5.000E-03
22                                 1.000E-02
23 L                               1.500E-02
24                                 2.000E-02
25 L                               2.500E-02
26                                 3.000E-02
27 L                               3.500E-02
28                                 4.000E-02
29 L                               4.500E-02
30                                 5.000E-02
31 L                               5.500E-02
32                                 6.000E-02
33 L                               6.500E-02
34                                 7.000E-02
35 L                               7.500E-02
36                                 8.000E-02
37 L                               8.500E-02
38                                 9.000E-02
39 L                               9.500E-02
40                                 1.000E-01
    12345678901234567890
              1         2
```

```
  MFX   NOS/BE 1.2    KAFB  011 MFX   07/10/78
  FLCM=314000 MXCM=250000 FLEC=1720K  MXEC=0600K
+
13.49.08.GABY31X  FROM MX2/IS
13.49.09.IP  00000320 WORDS - FILE INPUT  , DC 04
13.49.09.GABY3,T177,I0177,P50,NT1,MT1.
13.49.10.ACCOUNT,GABY,**********-****,DYP.
13.49.11.SYSBULL(BATCH)
13.49.12.ATTACH,HULLIB,ID=DYMXCER.
13.49.12.PFN IS
13.49.12.HULLIB
13.49.12.PF CYCLE NO. = 039
13.49.12.LIBRARY,HULLIB.
13.49.12.HULLR.
13.49.14.COPYCR(LOCAL,HHH)
13.49.15.RETURN(LOCAL)
13.49.16.IFE,FILE(CHANGES,IN),CPR.
13.49.18.ENDIF,CPR.
13.49.18.IFE,FILE(CHANGES,AS.AND.,NOT.IN),CPY.
13.49.19.ENDIF,CPY.
13.49.51.GETC.HHH.
13.49.55.ATTACH(XXX,CH105,ID=DYMXCER)
13.49.56.PF CYCLE NO. = 012
13.49.56.COPYCR(XXX,HHH)
13.49.57.RETURN(XXX)
13.50.29.REVERT.
13.50.30.CONTR,BOW.
13.50.32.     END  CNT
13.50.32.FILE(TAPE10,SBF=NO)
13.50.34.FILE(TAPE11,SBF=NO)
13.50.34.FILE(TAPE41,SBF=NO)
13.50.35.FILE(TAPE42,SBF=NO)
13.50.36.LDSET(FILES=TAPE10/TAPE11/TAPE41/TAPE42)
13.50.37.BOW.
13.50.39.REQUEST(TAPE10,*PF)
13.50.39.REQUEST(TAPE42,*PF)
13.52.54.STERN   15 RESOURCE TAPES REMAINING
13.53.15.KEEL    13 RESOURCE TAPES REMAINING
13.53.44.CT ID=  DYMXCER PFN=DYMASTLIBRARY
13.53.44.CT CY= 002  00039104 WORDS.
13.53.44.EX ID=  DYMXCER PFN=DYMASTLIBRARY
13.53.44.EX CY= 001  00000000 WORDS.
13.53.49.EX ID=  DYMXCER PFN=DYMASTLIBRARY
13.53.49.EX CY= 001  00039104 WORDS.
13.53.49.PR ID=  DYMXCER PFN=DYMASTLIBRARY
13.53.49.PR CY= 002  00039104 WORDS.
13.53.49.NEED IK110  EE36
13.53.52.     END  BOW
13.53.52.CONTR,PLANK.
13.53.53.     END  CNT
13.53.53.FILE(TAPE4,SBF=NO)
13.53.54.FILE(TAPE41,SBF=NO)
13.53.55.LDSET(FILES=TAPE4/TAPE41)
13.53.55.PLANK.
13.53.56.GENERATING KEEL     WA-ECS/LCM VERSION
13.53.57.     END  PLANK
13.53.57.CONTR,SAIL.
13.53.59.     END  CNT
13.53.59.DYMAST(I=HHH)
13.55.21.    6945  CARDS GENERATED
13.55.21.  END OF  NORMAL     RUN
13.55.21.  SYSTEM  HULL       VERSION  105
13.55.22.  EXIT
13.55.22.RETURN(HHH)
13.55.23.RETURN(SAVE)
13.55.27.REQUEST(SAVE,*Q)
13.55.29.CONTR,COMPILE.
13.55.31.     END  CNT
13.55.31.IFE,R2.EQ.2,COMPS.
13.55.32.ELSE,COMPS.
13.55.32.FTN(A,I=SAIL,PL=1000000,B=HULL,OPT=2,L=S
13.55.32.AVE)
13.57.29.     4.554 CP SECONDS COMPILATION TIME
13.57.29.ENDIF,COMPS.
13.57.30.RETURN(SAIL,LOCAL)
13.57.31.IFE,R2.NE.0,MET.
13.57.33.ENDIF,MET.
13.57.33.RETURN(MAP)
13.57.34.REQUEST(MAP,*Q)
13.57.35.CONTR,LOAD.
13.57.43.     END  CNT
13.57.43.IFE,R2.EQ.2,RUNS.
13.57.44.ELSE,RUNS.
13.57.44.IFE,R1.NE.0,H176.
13.57.57.HULE176,COMMENT.
13.58.02.FILE(TAPE4,SBF=NO)
13.58.10.FILE(TAPE41,SBF=NO)
13.58.14.FILE(TAPE9,SBF=NO)
13.58.18.FILE(TAPE40,SBF=NO)
13.58.21.FILE(TAPE10,SBF=NO)
13.58.23.FILE(TAPE44,SBF=NO)
13.58.24.FILE(TAPE45,SBF=NO)
13.58.27.LDSET(PRESETA=NGINDEF,MAP=SBEX/MAP)
13.58.27.LDSET(FILES=TAPE4/TAPE41/TAPE9/TAPE40/TA
13.58.27.PE10)
13.58.27.LDSET(FILES=TAPE44/TAPE45)
13.58.27.HULL.
14.04.37.REQUEST(TAPE4,*NT,PE,RING,IU,U,E,VSN=0IK110)
14.04.37.( NT 066 ASSIGNED)
14.04.38.NT66 VOLUME SERIAL NUMBER IS  0IK110
14.04.42.NT66  BLOCKS WRITTEN -000047
14.06.58.REQUEST(TAPE9,*MT,HY,RING,IU,U,E,VSN=00EE36)
14.06.58.( MT 052 ASSIGNED)
14.06.58.MT52 VOLUME SERIAL NUMBER IS  00EE36
14.07.04.MT52  BLOCKS WRITTEN -000005
14.07.04.REQUEST(TAPE41,*PF)
14.07.55.CT ID=  DYMXCER PFN=PROBLEMMASTAPE41INFO1P3000
14.07.55.CT CY= 001  00000576 WORDS.
```

```
14.07.57.     END  KEEL
14.07.57.     1.098 CP SECONDS EXECUTION TIME
14.07.57.RETURN(TAPE4,HULL)
14.07.58.REVERT.
14.08.00.ELSE,H176.
14.08.02.ENDIF,H176.
14.08.02.ENDIF,RUNS.
14.08.05.ACCOUN.
14.08.07.ACCOUNT FILE = ACCOUNTKJ2BV10F5P8
14.08.07.  ACCOUNT ID = DYMXCER
14.08.15.     END  ACCNT
14.08.15.REVERT.
14.08.17.OP  00002560 WORDS - FILE FILMPR , DC 20
14.08.17.OP  00003904 WORDS - FILE OUTPUT , DC 40
14.08.17.MS   14336  WORDS  (  229376 MAX USED)
14.08.17.CPA     22.721 SEC.       22.721 ADJ.
14.08.17.IO      72.453 SEC.       18.113 ADJ.
14.08.17.CM    1521.564 KWS.        6.384 ADJ.
14.08.17.SS                        47.219
14.08.17.PP     168.340 SEC.     DATE 08/16/78
14.08.17.COST ESTIMATE            $ 7.93
14.08.17.EJ  END OF JOB, IS
```

PROBLEM 1.3 SYSTEM 370 HULL RUN

```
//AF2001H JOB (AF2001,,10,25),'HULL RUN',MSGCLASS=H,CLASS=C,
//         NOTIFY=AF2001
//HULL EXEC HULL,GENO='.V105',FPARM='NOSOURCE,TERM',
//       PS1='SYSOUT=H,HOLD=YES',PS2='SYSOUT=H,HOLD=YES',
//       FP1='DUMMY',LP1='SYSOUT=H,HOLD=YES',
//       HP1='SYSOUT=H,HOLD=YES',HTIME=5,LIBPRE='AF2001.',
//       OLDPRE='AF2001.',PP1='SYSOUT=H,HOLD=YES',PTIME='(0,10)'
//HULL.DATA DD  DSN=AF2001.HULL.PROB1P3,DISP=(OLD,KEEP),
//     DCB=(RECFM=VBS,LRECL=7220,BLKSIZE=7224)
//HULL.STATION  DD DSN=AF2001.HULL.STAT1P3,DISP=(OLD,KEEP)
//HULL.INPUT DD  *
HULL
PROBLEM 1.3
CYCLE=0
INPUT
CSTOP= 150
REZONE=0
RTSTOP=0.06
COLD=T
TIMES=3 DMPINT=1.E-6
MRELER=10
/*
//SAIL.INPUT  DD  DSN=AF2001.CHANG.DATA,DISP=(OLD,KEEP)
//FORT.SYSTERM  DD SYSOUT=H,HOLD=YES
END OF DATA
```

180

```
                                                    J E S 2   J O B   L O G
13.48.41 JOB  279  $HASP373 AF2001H  STARTED - INIT  3 - CLASS C - SYS A168
13.48.44 JOB  279  AF2001H  HULL     13:48:41      2       0.23  S000
13.48.49 JOB  279  AF2001H  PLANK    13:48:44      5       0.80  S000
13.58.33 JOB  279  AF2001H  SAIL     13:48:49    584     107.69  S000
14.02.41 JOB  279  AF2001H  FORT     13:58:33    248      28.42  S004
14.03.16 JOB  279  AF2001H  LKED     14:02:42     34       2.56  S000
14.10.25 JOB  279  AF2001H  GO       14:03:16    428     210.74  S000
14.10.25 JOB  279  $HASP395 AF2001H  ENDED

OUT
```

```
1    //AF2001H JOB (AF2001,,10,25),'HULL RUN',MSGCLASS=H,CLASS=C,          JOB  279
     //         NOTIFY=AF2001                                              00000020
     //HULL    PROC LIB=HULLIB,                                          X00000030
     //             LIBPRE='SAIL.',                                       X00000040
     //             LIBU=,                                                X00000050
     //             LIBVOL=,                                              X00000060
     //             CHNBLK=3521,                                          X00000070
     //             CREG=100K,                                            X00000080
     //             CHNLRL=3517,                                          X00000090
     //             FILO=,                                                X00000100
     //             FLIB='SYS1.FORTLIB',                                  X00000110
     //             FPARM=MAP,                                            X00000120
     //             FPROG=IFEAAB,                                         X00000130
     //             FREG=512K,                                            X00000140
     //             FP1='SYSOUT=A',                                       X00000150
     //             FSPACE='(CYL,(10,5),RLSE)',                           X00000160
     //             FTIME='(1,0)',                                        X00000170
     //             GENO='(0)',                                           X00000180
     //             GOSPACE='(CYL,(20,5,1))',                             X00000190
     //             LABO=,                                                X00000200
     //             LNAME=HULL,                                           X00000210
     //             LPARM='MAP',                                          X00000220
     //             LPROG=IEWL,                                           X00000230
     //             LREG=512K,                                            X00000240
     //             LP1='SYSOUT=A',                                       X00000250
     //             LTIME='(0,45)',                                       X00000260
     //             HULLSP='(CYL,(10,5),RLSE)',                           X00000270
     //             HP1='SYSOUT=A',                                       X00000280
     //             HREG=175K,                                            X00000290
     //             HTIME=2,                                              X00000300
     //             OLD=HULL,                                             X00000310
     //             OLDDCB=,                                              X00000320
     //             OLDDS=SHR,                                            X00000330
     //             OLDPRE='SAIL.',                                       X00000340
     //             OLDU=,                                                X00000350
     //             OLDVOL=,                                              X00000360
     //             PPROG=PLANK,                                          X00000370
     //             PP1='SYSOUT=A',                                       X00000380
     //             PRCN=5000,                                            X00000390
     //             PRCL=3640,                                            X00000400
     //             PREG=100K,                                            X00000410
     //             PTIME='(1,0)',                                        X00000420
     //             PS1='SYSOUT=A',                                       X00000430
     //             PS2='SYSOUT=A',                                       X00000440
     //             SAILBLK=800,                                          X00000450
     //             SAILR=80,                                             X00000460
     //             SCRTC=SYSDA,                                          X00000470
     //             SPROG=SAIL,                                           X00000480
     //             SREG=175K,                                            X00000490
```

```
//             STIME='(2,0)',                                          X00000500
//             WORKSP='(CYL,(5,5))'                                     00000510
//*-------------------------------------------------------------------* 00000520
//HULL    EXEC PGM=IEBGENER,REGION=&CREG                               00000530
//SYSPRINT  DD DUMMY                                                   00000540
//SYSIN     DD DUMMY                                                   00000550
//SYSUT1    DD DDNAME=INPUT                                            00000560
//SYSUT2    DD DSN=&&HULLI,                                           X00000570
//             DISP=(NEW,PASS),                                        X00000580
//             UNIT=&SCRTC.                                            X00000590
//             SPACE=(TRK,(5,5),RLSE),                                 X00000600
//             DCB=(RECFM=FB,LRECL=80,BLKSIZE=1600)                     00000610
//*-------------------------------------------------------------------* 00000620
//PLANK   EXEC PGM=&PPROG,TIME=&PTIME,REGION=&PREG                     00000630
//*                                                                    00000640
//STEPLIB   DD DSN=&LIBPRE&LIB,                                       X00000650
//             UNIT=&LIBU,                                             X00000660
//             VOL=&LIBVOL,                                            X00000670
//             DISP=SHR                                                00000680
//*                                                                    00000690
//FT04F001  DD DSNAME=*.HULL.DATA,DISP=(OLD,KEEP)                      00000700
//*                                                                    00000710
//FT05F001  DD DSN=&&HULLI,DISP=(OLD,PASS)                             00000720
//*                                                                    00000730
//FT06F001  DD &PP1,                                                  X00000740
//             DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                  00000750
//*                                                                    00000760
//FT07F001  DD DSN=&&ALTI,                                            X00000770
//             DISP=(NEW,PASS),                                        X00000780
//             UNIT=&SCRTC,                                            X00000790
//             SPACE=(TRK,(5,5),RLSE),                                 X00000800
//             DCB=(RECFM=FB,LRECL=80,BLKSIZE=1600)                     00000810
//*-------------------------------------------------------------------* 00000820
//SAIL    EXEC PGM=&SPROG,TIME=&STIME,REGION=&SREG,                   X00000830
//             COND=(8,LT,PLANK)                                       00000840
//*                                                                    00000850
//STEPLIB   DD DSN=&LIBPRE&LIB,                                       X00000860
//             UNIT=&LIBU,                                             X00000870
//             VOL=&LIBVOL,                                            X00000880
//             DISP=SHR                                                00000890
//*                                                                    00000900
//FT01F001  DD DUMMY                                                   00000910
//*                                                                    00000920
//FT02F001  DD DSN=&OLDPRE&OLD&GENO,                                  X00000930
//             UNIT=&OLDU,                                             X00000940
//             LABEL=(&FILO,&LABO,,IN),                                X00000950
//             DISP=&OLDDS,                                            X00000960
//             VOL=&OLDVOL,                                            X00000970
//             DCB=&OLDDCB                                             00000980
//*                                                                    00000990
//FT03F001  DD UNIT=&SCRTC,                                           X00001000
```

```
//                DISP=(NEW,DELETE),                                    X00001010
//                DCB=(RECFM=VBS,LRECL=&CHNLRL,BLKSIZE=&CHNBLK),        X00001020
//                SPACE=(TRK,(20,20))                                    00001030
//*                                                                      00001040
//FT04F001  DD &PS2,                                                     X00001050
//                DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                 00001060
//*                                                                      00001070
//FT05F001  DD DDNAME=INPUT                                              00001080
//*                                                                      00001090
//FT06F001  DD &PS1,                                                     X00001100
//                DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                 00001110
//*                                                                      00001120
//FT08F001  DD DSN=&&HULL,                                               X00001130
//                DISP=(NEW,PASS),                                       X00001140
//                UNIT=&SCRTC,                                           X00001150
//                SPACE=&HULLSP,                                         X00001160
//                DCB=(RECFM=FB,LRECL=&SAILR,BLKSIZE=&SAILBLK)           00001170
//*                                                                      00001180
//FT09F001  DD DSN=&&ALTI,DISP=(OLD,DELETE)                              00001190
//*                                                                      00001200
//FT10F001  DD UNIT=&SCRTC,                                              X00001210
//                DISP=(NEW,DELETE),                                     X00001220
//                SPACE=(&PRCL,(&PRCN))                                  00001230
//*                                                                      00001240
//FT11F001  DD DUMMY                                                     00001250
//*                                                                      00001260
//FT12F001  DD DUMMY                                                     00001270
//*--------------------------------------------------------------------* 00001280
//FORT    EXEC PGM=&FPROG,REGION=&FREG,PARM='&FPARM',TIME=&FTIME,        X00001290
//                COND=((8,LT,PLANK),(8,LT,SAIL))                        00001300
//*                                                                      00001310
//SYSPRINT  DD &FP1,                                                     X00001320
//                DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                 00001330
//*                                                                      00001340
//SYSLIN    DD DSN=&&LOADSET,                                            X00001350
//                DISP=(MOD,PASS),                                       X00001360
//                UNIT=&SCRTC,                                           X00001370
//                SPACE=&FSPACE,                                         X00001380
//                DCB=(RECFM=BF,LRECL=80,BLKSIZE=1600)                   00001390
//*                                                                      00001400
//SYSIN     DD DSN=&&HULL,DISP=(OLD,DELETE)                              00001410
//*                                                                      00001420
//SYSUT1    DD UNIT=&SCRTC,SPACE=(CYL,(2,2))                             00001430
//*                                                                      00001440
//SYSUT2    DD UNIT=&SCRTC,SPACE=(CYL,(2,2))                             00001450
//*                                                                      00001460
//SYSTERM   DD DUMMY                                                     00001470
//*--------------------------------------------------------------------* 00001480
//LKED    EXEC PGM=&LPROG,REGION=&LREG,TIME=&LTIME,                      X00001490
//                COND=((4,LT,FORT),(8,LT,SAIL),(8,LT,PLANK)),           X00001500
//                PARM='&LPARM'                                          00001510
```

```
//*                                                                    00001520
//SYSPRINT  DD &LP1,                                                  X00001530
//             DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                 00001540
//*                                                                    00001550
//SYSLIB    DD DSN=&LIBPRE&LIB,DISP=SHR                               00001560
//          DD DSN=&FLIB,DISP=SHR                                     00001570
//*                                                                    00001580
//SYSUT1    DD UNIT=&SCRTC,SPACE=(1024,(200,20))                      00001590
//*                                                                    00001600
//SYSLMOD   DD DSN=&&GOSET(&LNAME),                                   X00001610
//             UNIT=&SCRTC,                                           X00001620
//             DISP=(,PASS),                                          X00001630
//             SPACE=&GOSPACE                                         00001640
//*                                                                    00001650
//SYSLIN    DD DSN=&&LOADSET,DISP=(OLD,DELETE)                        00001660
//*--------------------------------------------------------------------* 00001670
//GO       EXEC PGM=*.LKED.SYSLMOD,TIME=(&HTIME,0),REGION=&HREG,      X00001680
//             PARM=' &HTIME ',                                       X00001690
//             COND=((4,LT,LKED),(4,LT,FORT),(8,LT,SAIL),(8,LT,PLANK)) 00001700
//*                                                                    00001710
//FT04F001  DD DSN=*.HULL.DATA,DISP=(OLD,KEEP)                        00001720
//*                                                                    00001730
//FT05F001  DD DSN=&&HULLI,DISP=(OLD,DELETE)                          00001740
//*                                                                    00001750
//FT06F001  DD &HP1,                                                  X00001760
//             DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                 00001770
//*                                                                    00001780
//FT09F001  DD DSNAME=*.HULL.STATION,DISP=(OLD,KEEP)                  00001790
//*                                                                    00001800
//FT10F001  DD UNIT=&SCRTC,                                           X00001810
//             SPACE=&WORKSP,                                         X00001820
//             DISP=(NEW,DELETE),                                     X00001830
//             DCB=*.HULL.DATA                                        00001840
//*                                                                    00001850
//FT11F001  DD UNIT=&SCRTC,                                           X00001860
//             SPACE=&WORKSP,                                         X00001870
//             DISP=(NEW,DELETE),                                     X00001880
//             DCB=*.HULL.DATA                                        00001890
//*                                                                    00001900
//FT12F001  DD UNIT=&SCRTC,                                           X00001910
//             SPACE=&WORKSP,                                         X00001920
//             DISP=(NEW,DELETE),                                     X00001930
//             DCB=*.HULL.DATA                                        00001940
//*                                                                    00001950
//FT13F001  DD UNIT=&SCRTC,                                           X00001960
//             SPACE=&WORKSP,                                         X00001970
//             DISP=(NEW,DELETE),                                     X00001980
//             DCB=*.HULL.DATA                                        00001990
//*                                                                    00002000
//FT14F001  DD UNIT=&SCRTC,                                           X00002010
//             SPACE=&WORKSP,                                         X00002020
```

```
//             DISP=(NEW,DELETE),                                          X00002030
//             DCB=*.HULL.DATA                                              00002040
//*                                                                         00002050
//FT15F001  DD UNIT=&SCRTC,                                                X00002060
//             SPACE=&WORKSP,                                              X00002070
//             DISP=(NEW,DELETE),                                          X00002080
//             DCB=*.HULL.DATA                                              00002090
//*                                                                         00002100
//FT21F001  DD UNIT=&SCRTC,                                                X00002110
//             SPACE=&WORKSP,                                              X00002120
//             DISP=(NEW,DELETE),                                          X00002130
//             DCB=*.HULL.DATA                                              00002140
//*                                                                         00002150
//FT22F001  DD UNIT=&SCRTC,SEP=FT21F001,                                   X00002160
//             SPACE=&WORKSP,                                              X00002170
//             DISP=(NEW,DELETE),                                          X00002180
//             DCB=*.HULL.DATA                                              00002190
//*                                                                         00002200
//FT23F001  DD UNIT=&SCRTC,SEP=(FT21F001,FT22F001),                        X00002210
//             SPACE=&WORKSP,                                              X00002220
//             DISP=(NEW,DELETE),                                          X00002230
//             DCB=*.HULL.DATA                                              00002240
//*                                                                         00002250
//       PEND                                                              00002260
2   //HULL EXEC HULL,GENO='.V105',FPARM='NOSOURCE,TERM',                    00002270
//       PS1='SYSOUT=H,HOLD=YES',PS2='SYSOUT=H,HOLD=YES',                  00002280
//       FP1='DUMMY',LP1='SYSOUT=H,HOLD=YES',                              00002290
//       HP1='SYSOUT=H,HOLD=YES',HTIME=5,LIBPRE='AF2001.',                 00002300
//       OLDPRE='AF2001.',PP1='SYSOUT=H,HOLD=YES',PTIME='(0,10)'           00002310
3   ++HULL    PROC LIB=HULLIB,                                            X00000030
++             LIBPRE='SAIL.',                                            X00000040
++             LIBU=,                                                     X00000050
++             LIBVOL=,                                                   X00000060
++             CHNBLK=3521,                                               X00000070
++             CREG=100K,                                                 X00000080
++             CHNLRL=3517,                                               X00000090
++             FILO=,                                                     X00000100
++             FLIB='SYS1.FORTLIB',                                       X00000110
++             FPARM=MAP,                                                 X00000120
++             FPROG=IFEAAB,                                              X00000130
++             FREG=512K,                                                 X00000140
++             FP1='SYSOUT=A',                                            X00000150
++             FSPACE='(CYL,(10,5),RLSE)',                                X00000160
++             FTIME='(1,0)',                                             X00000170
++             GENO='(0)',                                                X00000180
++             GOSPACE='(CYL,(20,5,1))',                                  X00000190
++             LABO=,                                                     X00000200
++             LNAME=HULL,                                                X00000210
++             LPARM='MAP',                                               X00000220
++             LPROG=IEWL,                                                X00000230
++             LREG=512K,                                                 X00000240
```

```
++            LP1='SYSOUT=A',                                          X00000250
++            LTIME='(0,45)',                                          X00000260
++            HULLSP='(CYL,(10,5),RLSE)',                              X00000270
++            MP1='SYSOUT=A',                                          X00000280
++            MREG=175K,                                               X00000290
++            MTIME=2,                                                 X00000300
++            OLD=HULL,                                                X00000310
++            OLDDCB=,                                                 X00000320
++            OLDDS=SHR,                                               X00000330
++            OLDPRE='SAIL.',                                          X00000340
++            OLDU=,                                                   X00000350
++            OLDVOL=,                                                 X00000360
++            PPROG=PLANK,                                             X00000370
++            PP1='SYSOUT=A',                                          X00000380
++            PRCN=5000,                                               X00000390
++            PRCL=3640,                                               X00000400
++            PREG=100K,                                               X00000410
++            PTIME='(1,0)',                                           X00000420
++            PS1='SYSOUT=A',                                          X00000430
++            PS2='SYSOUT=A',                                          X00000440
++            SAILBLK=800,                                             X00000450
++            SAILR=80,                                                X00000460
++            SCRTC=SYSDA,                                             X00000470
++            SPROG=SAIL,                                              X00000480
++            SREG=175K,                                               X00000490
++            STIME='(2,0)',                                           X00000500
++            WORKSP='(CYL,(5,5))'                                      00000510
***-------------------------------------------------------------------* 00000520
 4  ++HULL    EXEC PGM=IEBGENER,REGION=&CREG                            00000530
 5  ++SYSPRINT  DD DUMMY                                                00000540
 6  ++SYSIN     DD DUMMY                                                00000550
 7  ++SYSUT1    DD DDNAME=INPUT                                         00000560
 8  ++SYSUT2    DD DSN=&&HULLI,                                         X00000570
++              DISP=(NEW,PASS),                                         X00000580
++              UNIT=&SCRTC,                                             X00000590
++              SPACE=(TRK,(5,5),RLSE),                                  X00000600
++              DCB=(RECFM=FB,LRECL=80,BLKSIZE=1600)                      00000610
***-------------------------------------------------------------------* 00000620
 9  //HULL.DATA DD  DSN=AF2001.HULL.PROB1P3,DISP=(OLD,KEEP),            00002320
//      DCB=(RECFM=VBS,LRECL=7220,BLKSIZE=7224)                          00002330
10  //HULL.STATION  DD DSN=AF2001.HULL.STAT1P3,DISP=(OLD,KEEP)          00002340
11  //HULL.INPUT DD  *                                                  00002350
12  ++PLANK   EXEC PGM=&PPROG,TIME=&PTIME,REGION=&PREG                  00000630
***                                                                     00000640
13  ++STEPLIB   DD DSN=&LIBPRE&LIB,                                     X00000650
++              UNIT=&LIBU,                                              X00000660
++              VOL=&LIBVOL,                                             X00000670
++              DISP=SHR                                                  00000680
***                                                                     00000690
14  ++FT04F001  DD DSNAME=*.HULL.DATA,DISP=(OLD,KEEP)                   00000700
***                                                                     00000710
```

```
15    ++FT05F001  DD DSN=&&HULLI,DISP=(OLD,PASS)                                00000720
      ***                                                                       00000730
16    ++FT06F001  DD &PP1,                                                     X00000740
      ++             DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                    00000750
      ***                                                                       00000760
17    ++FT07F001  DD DSN=&&ALTI,                                               X00000770
      ++             DISP=(NEW,PASS),                                          X00000780
      ++             UNIT=&SCRTC,                                              X00000790
      ++             SPACE=(TRK,(5,5),RLSE),                                   X00000800
      ++             DCB=(RECFM=FB,LRECL=80,BLKSIZE=1600)                      00000810
      ***-------------------------------------------------------------------* 00000820
18    ++SAIL    EXEC PGM=&SPROG,TIME=&STIME,REGION=&SREG,                      X00000830
      ++             COND=(8,LT,PLANK)                                         00000840
      ***                                                                       00000850
19    ++STEPLIB   DD DSN=&LIBPRE&LIB,                                          X00000860
      ++             UNIT=&LIBU,                                               X00000870
      ++             VOL=&LIBVOL,                                              X00000880
      ++             DISP=SHR                                                  00000890
      ***                                                                       00000900
20    ++FT01F001  DD DUMMY                                                     00000910
      ***                                                                       00000920
21    ++FT02F001  DD DSN=&OLDPRE&OLD&GENO,                                     X00000930
      ++             UNIT=&OLDU,                                               X00000940
      ++             LABEL=(&FILO,&LABO,,IN),                                  X00000950
      ++             DISP=&OLDDS,                                              X00000960
      ++             VOL=&OLDVOL,                                              X00000970
      ++             DCB=&OLDDCB                                               00000980
      ***                                                                       00000990
22    ++FT03F001  DD UNIT=&SCRTC,                                              X00001000
      ++             DISP=(NEW,DELETE),                                        X00001010
      ++             DCB=(RECFM=VBS,LRECL=&CHNLRL,BLKSIZE=&CHNBLK),            X00001020
      ++             SPACE=(TRK,(20,20))                                       00001030
      ***                                                                       00001040
23    ++FT04F001  DD &PS2,                                                     X00001050
      ++             DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                    00001060
      ***                                                                       00001070
24    ++FT05F001  DD DDNAME=INPUT                                              00001080
      ***                                                                       00001090
25    ++FT06F001  DD &PS1,                                                     X00001100
      ++             DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                    00001110
      ***                                                                       00001120
26    ++FT08F001  DD DSN=&&HULL,                                               X00001130
      ++             DISP=(NEW,PASS),                                          X00001140
      ++             UNIT=&SCRTC,                                              X00001150
      ++             SPACE=&HULLSP,                                            X00001160
      ++             DCB=(RECFM=FB,LRECL=&SAILR,BLKSIZE=&SAILBLK)              00001170
      ***                                                                       00001180
27    ++FT09F001  DD DSN=&&ALTI,DISP=(OLD,DELETE)                              00001190
      ***                                                                       00001200
28    ++FT10F001  DD UNIT=&SCRTC,                                              X00001210
      ++             DISP=(NEW,DELETE),                                        X00001220
```

```
++             SPACE=(&PRCL,(&PRCN))                                    00001230
***                                                                     00001240
29  ++FT11F001  DD DUMMY                                               00001250
***                                                                     00001260
30  ++FT12F001  DD DUMMY                                               00001270
***---------------------------------------------------------------------* 00001280
31  //SAIL.INPUT  DD  DSN=AF2001.CHANG.DATA,DISP=(OLD,KEEP)             00002470
32  ++FORT    EXEC PGM=&FPROG,REGION=&FREG,PARM='&FPARM',TIME=&FTIME,   X00001290
++             COND=((8,LT,PLANK),(8,LT,SAIL))                          00001300
***                                                                     00001310
33  ++SYSPRINT  DD &FP1,                                               X00001320
++             DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                   00001330
***                                                                     00001340
34  ++SYSLIN    DD DSN=&&LOADSET,                                      X00001350
++             DISP=(MOD,PASS),                                         X00001360
++             UNIT=&SCRTC,                                             X00001370
++             SPACE=&FSPACE,                                           X00001380
++             DCB=(RECFM=BF,LRECL=80,BLKSIZE=1600)                     00001390
***                                                                     00001400
35  ++SYSIN     DD DSN=&&HULL,DISP=(OLD,DELETE)                        00001410
***                                                                     00001420
36  ++SYSUT1    DD UNIT=&SCRTC,SPACE=(CYL,(2,2))                       00001430
***                                                                     00001440
37  ++SYSUT2    DD UNIT=&SCRTC,SPACE=(CYL,(2,2))                       00001450
***                                                                     00001460
38  //FORT.SYSTERM  DD SYSOUT=H,HOLD=YES                                00002480
+/SYSTERM   DD DUMMY                                                   00001470
***---------------------------------------------------------------------* 00001480
39  ++LKED    EXEC PGM=&LPROG,REGION=&LREG,TIME=&LTIME,                X00001490
++             COND=((4,LT,FORT),(8,LT,SAIL),(8,LT,PLANK)),             X00001500
++             PARM='&LPARM'                                            00001510
***                                                                     00001520
40  ++SYSPRINT  DD &LP1,                                               X00001530
++             DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)                   00001540
***                                                                     00001550
41  ++SYSLIB    DD DSN=&LIBPRE&LIB,DISP=SHR                            00001560
42  ++          DD DSN=&FLIB,DISP=SHR                                  00001570
***                                                                     00001580
43  ++SYSUT1    DD UNIT=&SCRTC,SPACE=(1024,(200,20))                   00001590
***                                                                     00001600
44  ++SYSLMOD   DD DSN=&&GOSET(&LNAME),                                X00001610
++             UNIT=&SCRTC,                                             X00001620
++             DISP=(,PASS),                                            X00001630
++             SPACE=&GOSPACE                                           00001640
***                                                                     00001650
45  ++SYSLIN    DD DSN=&&LOADSET,DISP=(OLD,DELETE)                     00001660
***---------------------------------------------------------------------* 00001670
46  ++GO      EXEC PGM=*.LKED.SYSLMOD,TIME=(&HTIME,0),REGION=&HREG,    X00001680
++             PARM='  &HTIME  ',                                       X00001690
++             COND=((4,LT,LKED),(4,LT,FORT),(8,LT,SAIL),(8,LT,PLANK))  00001700
***                                                                     00001710
```

```
47    ++FT04F001  DD DSN=*.HULL.DATA,DISP=(OLD,KEEP)                    00001720
      ***                                                               00001730
48    ++FT05F001  DD DSN=&&HULLI,DISP=(OLD,DELETE)                      00001740
      ***                                                               00001750
49    ++FT06F001  DD &HP1,                                             X00001760
      ++            DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1330)             00001770
      ***                                                               00001780
50    ++FT09F001  DD DSNAME=*.HULL.STATION,DISP=(OLD,KEEP)              00001790
      ***                                                               00001800
51    ++FT10F001  DD UNIT=&SCRTC,                                      X00001810
      ++            SPACE=&WORKSP,                                     X00001820
      ++            DISP=(NEW,DELETE),                                 X00001830
      ++            DCB=*.HULL.DATA                                    00001840
      ***                                                               00001850
52    ++FT11F001  DD UNIT=&SCRTC,                                      X00001860
      ++            SPACE=&WORKSP,                                     X00001870
      ++            DISP=(NEW,DELETE),                                 X00001880
      ++            DCB=*.HULL.DATA                                    00001890
      ***                                                               00001900
53    ++FT12F001  DD UNIT=&SCRTC,                                      X00001910
      ++            SPACE=&WORKSP,                                     X00001920
      ++            DISP=(NEW,DELETE),                                 X00001930
      ++            DCB=*.HULL.DATA                                    00001940
      ***                                                               00001950
54    ++FT13F001  DD UNIT=&SCRTC,                                      X00001960
      ++            SPACE=&WORKSP,                                     X00001970
      ++            DISP=(NEW,DELETE),                                 X00001980
      ++            DCB=*.HULL.DATA                                    00001990
      ***                                                               00002000
55    ++FT14F001  DD UNIT=&SCRTC,                                      X00002010
      ++            SPACE=&WORKSP,                                     X00002020
      ++            DISP=(NEW,DELETE),                                 X00002030
      ++            DCB=*.HULL.DATA                                    00002040
      ***                                                               00002050
56    ++FT15F001  DD UNIT=&SCRTC,                                      X00002060
      ++            SPACE=&WORKSP,                                     X00002070
      ++            DISP=(NEW,DELETE),                                 X00002080
      ++            DCB=*.HULL.DATA                                    00002090
      ***                                                               00002100
```

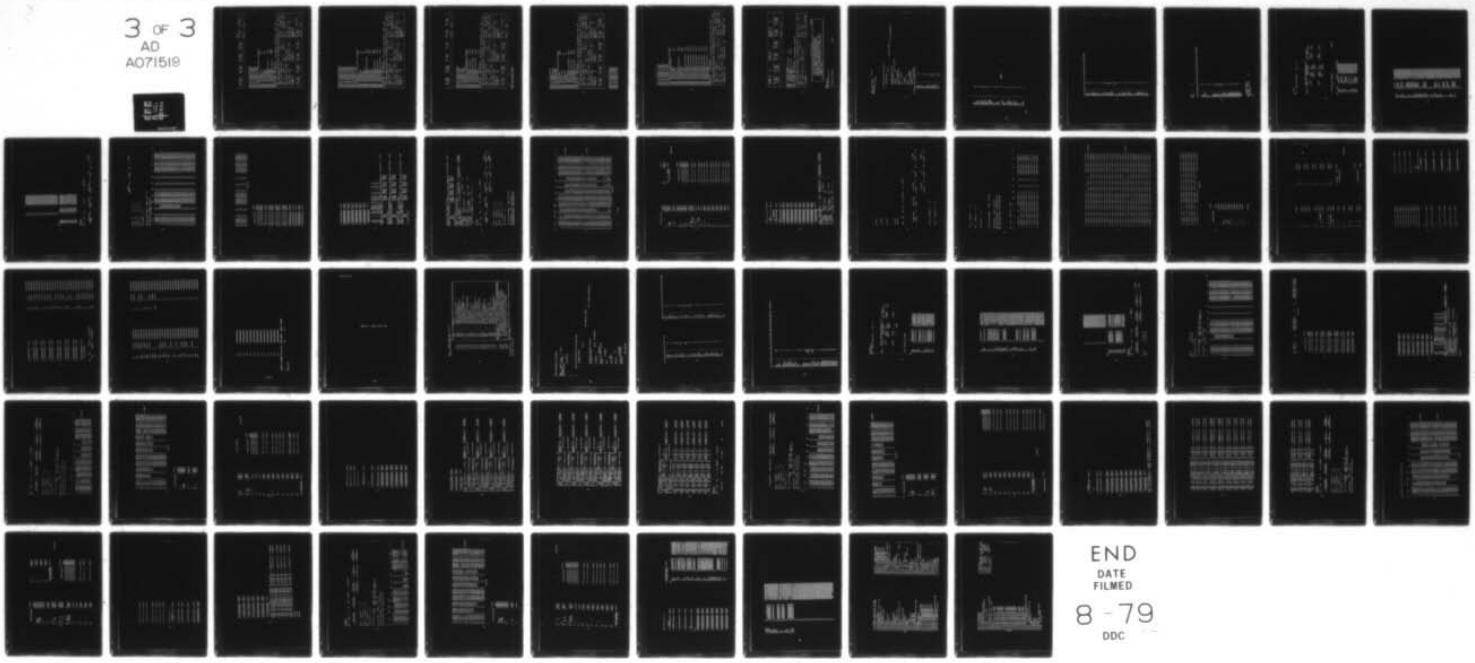
```
■  57     ++FT21F001  DD UNIT=&SCRTC,                                          X00002110
          ++             SPACE=&WORKSP,                                      X00002120
          ++             DISP=(NEW,DELETE),                                  X00002130
          ++             DCB=*.HULL.DATA                                      00002140
          ***                                                                 00002150
   58     ++FT22F001  DD UNIT=&SCRTC,SEP=FT21F001,                          ■ X00002160
          ++             SPACE=&WORKSP,                                      X00002170
          ++             DISP=(NEW,DELETE),                                  X00002180
          ++             DCB=*.HULL.DATA                                      00002190
          ***                                                                 00002200
   59     ++FT23F001  DD UNIT=&SCRTC,SEP=(FT21F001,FT22F001),                 X00002210
          ++             SPACE=&WORKSP,                                      X00002220
          ++             DISP=(NEW,DELETE),                                  X00002230
          ++             DCB=*.HULL.DATA                                      00002240
          ***                                                                 00002250

OUT
```

```
STMT NO. MESSAGE
-
    4      IEF653I SUBSTITUTION JCL - PGM=IEBGENER,REGION=100K
    8      IEF653I SUBSTITUTION JCL - UNIT=SYSDA,
   12      IEF653I SUBSTITUTION JCL - PGM=PLANK,TIME=(0,10),REGION=100K
   13      IEF653I SUBSTITUTION JCL - DSN=AF2001.HULLIB,
   13      IEF653I SUBSTITUTION JCL - UNIT=,
   13      IEF653I SUBSTITUTION JCL - VOL=,
   16      IEF653I SUBSTITUTION JCL - SYSOUT=H,HOLD=YES,
   17      IEF653I SUBSTITUTION JCL - UNIT=SYSDA,
   18      IEF653I SUBSTITUTION JCL - PGM=SAIL,TIME=(2,0),REGION=175K,
   19      IEF653I SUBSTITUTION JCL - DSN=AF2001.HULLIB,
   19      IEF653I SUBSTITUTION JCL - UNIT=,
*  19       IEF653I SUBSTITUTION JCL - VOL=,
   21      IEF653I SUBSTITUTION JCL - DSN=AF2001.HULL.V105,
   21      IEF653I SUBSTITUTION JCL - UNIT=,
   21      IEF653I SUBSTITUTION JCL - LABEL=(,,,IN),
   21      IEF653I SUBSTITUTION JCL - DISP=SHR,
   21      IEF653I SUBSTITUTION JCL - VOL=,
   21      IEF653I SUBSTITUTION JCL - DCB=
   22      IEF653I SUBSTITUTION JCL - UNIT=SYSDA,
   22     IEF653I SUBSTITUTION JCL - DCB=(RECFM=VBS,LRECL=3517,BLKSIZE=3521),
   23      IEF653I SUBSTITUTION JCL - SYSOUT=H,HOLD=YES,
6  25       IEF653I SUBSTITUTION JCL - SYSOUT=H,HOLD=YES,
   26      IEF653I SUBSTITUTION JCL - UNIT=SYSDA,
   26      IEF653I SUBSTITUTION JCL - SPACE=(CYL,(10,5),RLSE),
   26      IEF653I SUBSTITUTION JCL - DCB=(RECFM=FB,LRECL=80,BLKSIZE=800)
   28      IEF653I SUBSTITUTION JCL - UNIT=SYSDA,
   28      IEF653I SUBSTITUTION JCL - SPACE=(3640,(5000))
   32      IEF653I SUBSTITUTION JCL - PGM=IFEAAB,REGION=512K,PARM='NOSOURCE,TERM',TIME=(1,0),
   33      IEF653I SUBSTITUTION JCL - DUMMY,
   34      IEF653I SUBSTITUTION JCL - UNIT=SYSDA,
   34      IEF653I SUBSTITUTION JCL - SPACE=(CYL,(10,5),RLSE),
   36      IEF653I SUBSTITUTION JCL - UNIT=SYSDA,SPACE=(CYL,(2,2))
   37      IEF653I SUBSTITUTION JCL - UNIT=SYSDA,SPACE=(CYL,(2,2))
   39      IEF653I SUBSTITUTION JCL - PGM=IEWL,REGION=512K,TIME=(0,45),
   39      IEF653I SUBSTITUTION JCL - PARM='MAP'
   40      IEF653I SUBSTITUTION JCL - SYSOUT=H,HOLD=YES,
   41      IEF653I SUBSTITUTION JCL - DSN=AF2001.HULLIB,DISP=SHR
   42      IEF653I SUBSTITUTION JCL - DSN=SYS1.FORTLIB,DISP=SHR
   43      IEF653I SUBSTITUTION JCL - UNIT=SYSDA,SPACE=(1024,(200,20))
   44      IEF653I SUBSTITUTION JCL - DSN=&&GOSET(HULL),
   44      IEF653I SUBSTITUTION JCL - UNIT=SYSDA,
   44      IEF653I SUBSTITUTION JCL - SPACE=(CYL,(20,5,1))
   46      IEF653I SUBSTITUTION JCL - PGM=*.LKED.SYSLMOD,TIME=(5,0),REGION=175K,
   46      IEF653I SUBSTITUTION JCL - PARM='  5  ',
   49      IEF653I SUBSTITUTION JCL - SYSOUT=H,HOLD=YES,
```

```
51     IEF653I SUBSTITUTION JCL - UNIT=SYSDA,
51     IEF653I SUBSTITUTION JCL - SPACE=(CYL,(5,5)),
52     IEF653I SUBSTITUTION JCL - UNIT=SYSDA,
52     IEF653I SUBSTITUTION JCL - SPACE=(CYL,(5,5)),
53     IEF653I SUBSTITUTION JCL - UNIT=SYSDA,
53     IEF653I SUBSTITUTION JCL - SPACE=(CYL,(5,5)),
54     IEF653I SUBSTITUTION JCL - UNIT=SYSDA,
54     IEF653I SUBSTITUTION JCL - SPACE=(CYL,(5,5)),
55     IEF653I SUBSTITUTION JCL - UNIT=SYSDA,
55     IEF653I SUBSTITUTION JCL - SPACE=(CYL,(5,5)),
56     IEF653I SUBSTITUTION JCL - UNIT=SYSDA,
56     IEF653I SUBSTITUTION JCL - SPACE=(CYL,(5,5)),
57     IEF653I SUBSTITUTION JCL - UNIT=SYSDA,
57     IEF653I SUBSTITUTION JCL - SPACE=(CYL,(5,5)),
58     IEF653I SUBSTITUTION JCL - UNIT=SYSDA,SEP=FT21F001,
58     IEF653I SUBSTITUTION JCL - SPACE=(CYL,(5,5)),
59     IEF653I SUBSTITUTION JCL - UNIT=SYSDA,SEP=(FT21F001,FT22F001),
59     IEF653I SUBSTITUTION JCL - SPACE=(CYL,(5,5)),
IEF236I ALLOC. FOR AF2001H HULL HULL
IEF237I DMY  ALLOCATED TO SYSPRINT
IEF237I DMY  ALLOCATED TO SYSIN
IEF237I JES2 ALLOCATED TO SYSUT1
IEF237I 15A  ALLOCATED TO SYSUT2
IEF237I 492  ALLOCATED TO DATA
IEF237I 152  ALLOCATED TO SYS00142
IEF237I 492  ALLOCATED TO STATION
IEF142I AF2001H HULL HULL - STEP WAS EXECUTED - COND CODE 0000
IEF285I   JES2.JOB00279.SI0101                          SYSIN
IEF285I   SYS78153.T134841.RA000.AF2001H.HULLI          PASSED
IEF285I   VOL SER NOS= USER07.
IEF285I   AF2001.HULL.PROB1P3                           KEPT
IEF285I   VOL SER NOS= WORK50.
IEF285I   SYSCTLG.USER01                                KEPT
IEF285I   VOL SER NOS= USER01.
IEF285I   AF2001.HULL.STAT1P3                           KEPT
IEF285I   VOL SER NOS= WORK50.
IEF373I STEP /HULL    / START 78153.1348
IEF374I STEP /HULL    / STOP  78153.1348 CPU    0MIN 00.22SEC SRB    0MIN 00.01SEC VIRT    36K SYS   172K
*-------------------------------------------------------------------------------------------------------------*
*    HARRY DIAMOND LABORATORIES COMPUTER CENTER -- STEP TERMINATION STATISTICS   OS/VS2 REL 03.7   A168    06/02/78    *
*-------------------------------------------------------------------------------------------------------------*
*    JOBNAME = AF2001H  STEPNAME = HULL                    STEP # =   1       PGM = IEBGENER    COMP CODE =  0000   *
*-------------------------------------------------------------------------------------------------------------*
*    DPRTY = 118        PERFORM =  13      ASID =   4       PROT KEY =  8      SERVICE =      423 ADDRSPC = VIRTUAL  *
*-------------------------------------------------------------------------------------------------------------*
*    START = 13:48:41   STOP = 13:48:44    ELAPSED = 00:00:02                  CPU TIME =      0.23                *
*-------------------------------------------------------------------------------------------------------------*
*    REGION AVAILABLE = 10736K             REGION USED(SYSTEM) =   172K        REGION USED(USER) =    36K          *
*-------------------------------------------------------------------------------------------------------------*
*    PGM PAGES  IN =        2              VIO PAGES  IN =        0           SWAP PAGES  IN =        0           *
*    PGM PAGES OUT =        0              VIO PAGES OUT =        0           SWAP PAGES OUT =        0           *
```

AD-A071 519 AIR FORCE WEAPONS LAB KIRTLAND AFB NM F/G 15/6
THE INSTALLATION AND OPERATION OF HULL ON 370S. PART 1. (U)
JAN 79 L P GABY, M A FRY, C E RHOADES
UNCLASSIFIED AFWL-TR-78-134-PT-1 SBIE-AD-E200 324 NL

3 OF 3
AD
A071519



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DATE
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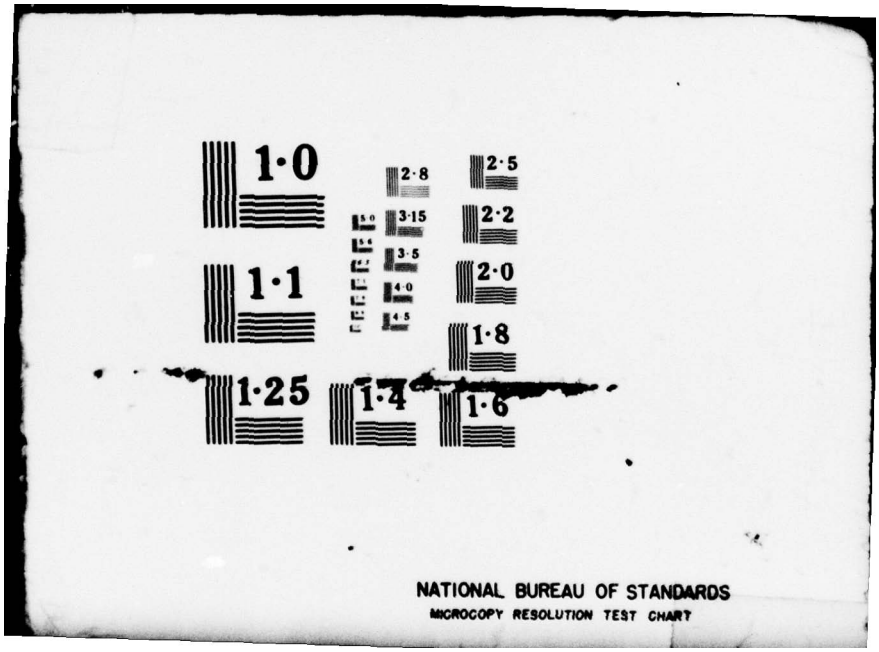
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4·0
4·5
1·4
2·5
2·2
2·0
1·8
1·6
NATIONAL BUREAU OF STANDARDS
MICROCOPY RESOLUTION TEST CHART

```
*                                                                             # SWAPS        =        0      *
*------------------------------------------------------------------------------------------------------------*
*   UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S   *
*    15A  000001        492  000000        152  000000        492  000000                                     *
*------------------------------------------------------------------------------------------------------------*
*                                                                             STEP COST =      $0.01          *
*------------------------------------------------------------------------------------------------------------*


IEF236I ALLOC. FOR AF2001H PLANK HULL
IEF237I 159  ALLOCATED TO STEPLIB
IEF237I 152  ALLOCATED TO SYS00144
IEF237I 492  ALLOCATED TO FT04F001
IEF237I 15A  ALLOCATED TO FT05F001
IEF237I JES2 ALLOCATED TO FT06F001
IEF237I 158  ALLOCATED TO FT07F001
IEF142I AF2001H PLANK HULL - STEP WAS EXECUTED - COND CODE 0000
IEF285I   AF2001.HULLIB                                   KEPT
IEF285I   VOL SER NOS= USER06.
IEF285I   SYSCTLG.USER01                                  KEPT
IEF285I   VOL SER NOS= USER01.
IEF285I   AF2001.HULL.PROB1P3                             KEPT
IEF285I   VOL SER NOS= WORK50.
IEF285I   SYS78153.T134841.RA000.AF2001H.HULLI            PASSED
IEF285I   VOL SER NOS= USER07.
IEF285I   JES2.JOB00279.S00102                            SYSOUT
IEF285I   SYS78153.T134841.RA000.AF2001H.ALTI             PASSED
IEF285I   VOL SER NOS= USER05.
IEF373I STEP /PLANK   / START 78153.1348
IEF374I STEP /PLANK   / STOP  78153.1348 CPU    0MIN 00.75SEC SRB    0MIN 00.05SEC VIRT    92K SYS   188K
*------------------------------------------------------------------------------------------------------------*
*   HARRY DIAMOND LABORATORIES COMPUTER CENTER -- STEP TERMINATION STATISTICS   OS/VS2 REL 03.7   A168   06/02/78   *
*------------------------------------------------------------------------------------------------------------*
*   JOBNAME = AF2001H  STEPNAME = PLANK                  STEP # =   2      PGM = PLANK       COMP CODE =  S000   *
*------------------------------------------------------------------------------------------------------------*
*   DPRTY = 118        PERFORM =  13       ASID =   4        PROT KEY =  8       SERVICE =     1588 ADDRSPC = VIRTUAL   *
*------------------------------------------------------------------------------------------------------------*
*   START = 13:48:44   STOP = 13:48:49     ELAPSED = 00:00:05                  CPU TIME =       0.80          *
*------------------------------------------------------------------------------------------------------------*
*   REGION AVAILABLE = 10736K              REGION USED(SYSTEM) =   188K        REGION USE=(USER) =    92K      *
*------------------------------------------------------------------------------------------------------------*
*   PGM PAGES  IN =          0             VIO PAGES  IN =          0         SWAP PAGES  IN =          0       *
*   PGM PAGES OUT =          0             VIO PAGES OUT =          0         SWAP PAGES OUT =          0       *
*                                                                             # SWAPS        =          0       *
*------------------------------------------------------------------------------------------------------------*
*   UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S   *
*    159  000000        152  000000        492  000002        15A  000010        158  000003                    *
*------------------------------------------------------------------------------------------------------------*
*                                                                             STEP COST =      $0.06          *
*------------------------------------------------------------------------------------------------------------*
```

```
IEF236I ALLOC. FOR AF2001H SAIL HULL
IEF237I 159  ALLOCATED TO STEPLIB
IEF237I 152  ALLOCATED TO SYS00146
IEF237I DMY  ALLOCATED TO FT01F001
IEF237I 492  ALLOCATED TO FT02F001
IEF237I 15A  ALLOCATED TO FT03F001
IEF237I JES2 ALLOCATED TO FT04F001
IEF237I 15D  ALLOCATED TO FT05F001
IEF237I JES2 ALLOCATED TO FT06F001
IEF237I 159  ALLOCATED TO FT08F001
IEF237I 158  ALLOCATED TO FT09F001
IEF237I 159  ALLOCATED TO FT10F001
IEF237I DMY  ALLOCATED TO FT11F001
IEF237I DMY  ALLOCATED TO FT12F001
IEF142I AF2001H SAIL HULL - STEP WAS EXECUTED - COND CODE 0000
IEF285I   AF2001.HULLIB                                  KEPT
IEF285I   VOL SER NOS= USER06.
IEF285I   SYSCTLG.USER01                                 KEPT
IEF285I   VOL SER NOS= USER01.
IEF285I   AF2001.HULL.V105                               KEPT
IEF285I   VOL SER NOS= WORK50.
IEF285I   SYS78153.T134841.RA000.AF2001H.R0000001        DELETED
IEF285I   VOL SER NOS= USER07.
IEF285I   JES2.JOB00279.S00103                           SYSOUT
IEF285I   AF2001.CHANG.DATA                              KEPT
IEF285I   VOL SER NOS= USER04.
IEF285I   JES2.JOB00279.S00104                           SYSOUT
IEF285I   SYS78153.T134841.RA000.AF2001H.HULL            PASSED
IEF285I   VOL SER NOS= USER06.
IEF285I   SYS78153.T134841.RA000.AF2001H.ALTI            DELETED
IEF285I   VOL SER NOS= USER05.
IEF285I   SYS78153.T134841.RA000.AF2001H.R0000002        DELETED
IEF285I   VOL SER NOS= USER06.
IEF373I STEP /SAIL    / START 78153.1348
IEF374I STEP /SAIL    / STOP  78153.1358 CPU    1MIN 37.31SEC SRB    0MIN 10.38SEC VIRT   168K SYS   236K
*-------------------------------------------------------------------------------------------------------*
*    HARRY DIAMOND LABORATORIES COMPUTER CENTER -- STEP TERMINATION STATISTICS   OS/VS2 REL 03.7   A168    06/02/78    *
*-------------------------------------------------------------------------------------------------------*
*    JOBNAME = AF2001H  STEPNAME = SAIL                    STEP # =   3       PGM = SAIL        COMP CODE =  S000   *
*-------------------------------------------------------------------------------------------------------*
*    DPRTY = 118        PERFORM =  13      ASID =   4       PROT KEY =  8      SERVICE =   218853 ADDRSPC = VIRTUAL  *
*-------------------------------------------------------------------------------------------------------*
*    START = 13:48:49   STOP = 13:58:33    ELAPSED = 00:09:44                 CPU TIME =    107.69                 *
*-------------------------------------------------------------------------------------------------------*
*    REGION AVAILABLE = 10736K            REGION USED(SYSTEM) =   236K        REGION USED(USER) =   168K           *
*-------------------------------------------------------------------------------------------------------*
*    PGM PAGES  IN =      138             VIO PAGES  IN =        0           SWAP PAGES  IN =        0            *
*    PGM PAGES OUT =      185             VIO PAGES OUT =        0           SWAP PAGES OUT =        0            *
*                                                                          # SWAPS        =        0            *
*-------------------------------------------------------------------------------------------------------*
```

```
*    UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S       UNIT# EXCP'S       UNIT  EXCP'S      *
*     159  000000        152  000000        492  000374        15A  000004        15D  000003        159  000888      *
*     158  000004        159  005324                                                                                  *
*-------------------------------------------------------------------------------------------------------------------*
*                                                                                STEP COST =      $9.98             *
*-------------------------------------------------------------------------------------------------------------------*


IEF236I ALLOC. FOR AF2001H FORT NULL
IEF237I DMY  ALLOCATED TO SYSPRINT
IEF237I 15A  ALLOCATED TO SYSLIN
IEF237I 159  ALLOCATED TO SYSIN
IEF237I 158  ALLOCATED TO SYSUT1
IEF237I 15D  ALLOCATED TO SYSUT2
IEF237I JES2 ALLOCATED TO SYSTERM
IEF142I AF2001H FORT NULL - STEP WAS EXECUTED - COND CODE 0004
IEF285I   SYS78153.T134841.RA000.AF2001H.LOADSET       PASSED
IEF285I   VOL SER NOS= USER07.
IEF285I   SYS78153.T134841.RA000.AF2001H.NULL          DELETED
IEF285I   VOL SER NOS= USER06.
IEF285I   SYS78153.T134841.RA000.AF2001H.R0000003      DELETED
IEF285I   VOL SER NOS= USER05.
IEF285I   SYS78153.T134841.RA000.AF2001H.R0000004      DELETED
IEF285I   VOL SER NOS= USER04.
IEF285I   JES2.JOB00279.S00105                         SYSOUT
IEF373I STEP /FORT    / START 78153.1358
IEF374I STEP /FORT    / STOP  78153.1402 CPU    0MIN 20.93SEC SRB    0MIN 07.49SEC VIRT   520K SYS   236K
*-------------------------------------------------------------------------------------------------------------------*
*    HARRY DIAMOND LABORATORIES COMPUTER CENTER -- STEP TERMINATION STATISTICS   OS/VS2 REL 03.7   A168    06/02/78    *
*-------------------------------------------------------------------------------------------------------------------*
*    JOBNAME = AF2001H  STEPNAME = FORT                    STEP # =   4       PGM = IFEAAB      COMP CODE =  S004   *
*-------------------------------------------------------------------------------------------------------------------*
*    DPRTY = 118        PERFORM =  13      ASID =   4       PROT KEY =  8      SERVICE =    96917 ADDRSPC = VIRTUAL  *
*-------------------------------------------------------------------------------------------------------------------*
*    START = 13:58:33   STOP = 14:02:41    ELAPSED = 00:04:08                 CPU TIME =     28.42                 *
*-------------------------------------------------------------------------------------------------------------------*
*    REGION AVAILABLE = 10736K             REGION USED(SYSTEM) =   236K       REGION USED(USER) =   520K          *
*-------------------------------------------------------------------------------------------------------------------*
*    PGM PAGES  IN =      247              VIO PAGES  IN =        0           SWAP PAGES  IN =        0           *
*    PGM PAGES OUT =      280              VIO PAGES OUT =        0           SWAP PAGES OUT =        0           *
*                                                                           # SWAPS        =        0           *
*-------------------------------------------------------------------------------------------------------------------*
*    UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S      *
*     15A  000150        159  000888        158  008869        15D  000000                                           *
*-------------------------------------------------------------------------------------------------------------------*
*                                                                                STEP COST =      $3.55             *
*-------------------------------------------------------------------------------------------------------------------*


IEF236I ALLOC. FOR AF2001H LKED NULL
IEF237I JES2 ALLOCATED TO SYSPRINT
```

```
IEF237I 159  ALLOCATED TO SYSLIB
IEF237I 490  ALLOCATED TO
IEF237I 152  ALLOCATED TO SYS00148
IEF237I 158  ALLOCATED TO SYSUT1
IEF237I 15D  ALLOCATED TO SYSLMOD
IEF237I 15A  ALLOCATED TO SYSLIN
IEF142I AF2001H LKED HULL - STEP WAS EXECU■■! COND CODE 0000
IEF285I   JES2.JOB00279.S00106                          SYSOUT
IEF285I   AF2001.HULLIB                                 KEPT
IEF285I   VOL SER NOS= USER06.
IEF285I   SYS1.FORTLIB                                  KEPT
IEF285I   VOL SER NOS= D50002.
IEF285I   SYSCTLG.USER01                                KEPT
IEF285I   VOL SER NOS= USER01.
IEF285I   SYS78153.T134841.RA000.AF2001H.R0000005       DELETED
IEF285I   VOL SER NOS= USER05.
IEF285I   SYS78153.T134841.RA000.AF2001H.GOSET          PASSED
IEF285I   VOL SER NOS= USER04.
IEF285I   SYS78153.T134841.RA000.AF2001H.LOADSET        DELETED
IEF285I   VOL SER NOS= USER07.
IEF373I STEP /LKED    / START 78153.1402
IEF374I STEP /LKED    / STOP  78153.1403 CPU    0MIN 02.04SEC SRB    0MIN 00.52SEC VIRT   196K SYS   240K
*-------------------------------------------------------------------------------------------------------------*
*    HARRY DIAMOND LABORATORIES COMPUTER CENTER -- STEP TERMINATION STATISTICS   OS/VS2 REL 03.7   A168    06/02/78   *
*-------------------------------------------------------------------------------------------------------------*
*    JOBNAME = AF2001H  STEPNAME = LKED                    STEP # =   5       PGM = IEWL        COMP CODE =  S000   *
*-------------------------------------------------------------------------------------------------------------*
*    DPRTY = 118        PERFORM =  13      ASID =   4       PROT KEY =  8      SERVICE =     8304 ADDRSPC = VIRTUAL  *
*-------------------------------------------------------------------------------------------------------------*
*    START = 14:02:42   STOP = 14:03:16    ELAPSED = 00:00:34                 CPU TIME =      2.56                 *
*-------------------------------------------------------------------------------------------------------------*
*    REGION AVAILABLE = 10736K             REGION USED(SYSTEM) =   240K       REGION USED(USER) =   196K           *
*-------------------------------------------------------------------------------------------------------------*
*    PGM PAGES  IN =       33              VIO PAGES  IN =        0           SWAP PAGES  IN =        0            *
*    PGM PAGES OUT =       49              VIO PAGES OUT =        0           SWAP PAGES OUT =        0            *
*                                                                           # SWAPS        =        0            *
*-------------------------------------------------------------------------------------------------------------*
*    UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S  *
*     159  000136        490  000191        152  000000        158  000204        15D  000141        15A  000151  *
*-------------------------------------------------------------------------------------------------------------*
*                                                                           STEP COST =     $0.29                *
*-------------------------------------------------------------------------------------------------------------*

IEF236I ALLOC. FOR AF2001H GO HULL
IEF237I 15D  ALLOCATED TO PGM=*.DD
IEF237I 492  ALLOCATED TO FT04F001
IEF237I 152  ALLOCATED TO SYS00150
IEF237I 15A  ALLOCATED TO FT05F001
IEF237I JES2 ALLOCATED TO FT06F001
IEF237I 492  ALLOCATED TO FT09F001
```

```
IEF237I 158  ALLOCATED TO FT10F001
IEF237I 159  ALLOCATED TO FT11F001
IEF237I 159  ALLOCATED TO FT12F001
IEF237I 15A  ALLOCATED TO FT13F001
IEF237I 15D  ALLOCATED TO FT14F001
IEF237I 158  ALLOCATED TO FT15F001
IEF237I 158  ALLOCATED TO FT21F001
IEF237I 15A  ALLOCATED TO FT22F001
IEF237I 15D  ALLOCATED TO FT23F001
IEF142I AF2001H GO HULL - STEP WAS EXECUTED - COND CODE 0000
IEF285I   SYS78153.T134841.RA000.AF2001H.GOSET          KEPT
IEF285I   VOL SER NOS= USER04.
IEF285I   AF2001.HULL.PROB1P3                           KEPT
IEF285I   VOL SER NOS= WORK50.
IEF285I   SYSCTLG.USER01                                KEPT
IEF285I   VOL SER NOS= USER01.
IEF285I   SYS78153.T134841.RA000.AF2001H.HULLI          DELETED
IEF285I   VOL SER NOS= USER07.
IEF285I   JES2.JOB00279.S00107                          SYSOUT
IEF285I   AF2001.HULL.STAT1P3                           KEPT
IEF285I   VOL SER NOS= WORK50.
IEF285I   SYS78153.T134841.RA000.AF2001H.R0000006       DELETED
IEF285I   VOL SER NOS= USER05.
IEF285I   SYS78153.T134841.RA000.AF2001H.R0000007       DELETED
IEF285I   VOL SER NOS= USER06.
IEF285I   SYS78153.T134841.RA000.AF2001H.R0000008       DELETED
IEF285I   VOL SER NOS= USER06.
IEF285I   SYS78153.T134841.RA000.AF2001H.R0000009       DELETED
IEF285I   VOL SER NOS= USER07.
IEF285I   SYS78153.T134841.RA000.AF2001H.R0000010       DELETED
IEF285I   VOL SER NOS= USER04.
IEF285I   SYS78153.T134841.RA000.AF2001H.R0000011       DELETED
IEF285I   VOL SER NOS= USER05.
IEF285I   SYS78153.T134841.RA00=.AF2001H.R0000012       DELETED
IEF285I   VOL SER NOS= USER05.
IEF285I   SYS78153.T134841.RA000.AF2001H.R0000013       DELETED
IEF285I   VOL SER NOS= USER07.
IEF285I   SYS78153.T134841.RA000.AF2001H.R0000014       DELETED
IEF285I   VOL SER NOS= USER04.
IEF373I STEP /GO      / START 78153.1403
IEF374I STEP /GO      / STOP  78153.1410 CPU    3MIN 28.23SEC SRB    0MIN 02.51SEC VIRT   228K SYS   240K
*-------------------------------------------------------------------------------------------------------------*
*    HARRY DIAMOND LABORATORIES COMPUTER CENTER -- STEP TERMINATION STATISTICS   OS/VS2 REL 03.7   A168   06/02/78   *
*-------------------------------------------------------------------------------------------------------------*
*    JOBNAME = AF2001H  STEPNAME = GO                        STEP # =   6      PGM = PGM=*.DD    COMP CODE =  S000   *
*-------------------------------------------------------------------------------------------------------------*
*    DPRTY = 118        PERFORM =  13      ASID =   4        PROT KEY =  8     SERVICE =   447415 ADDRSPC = VIRTUAL  *
*-------------------------------------------------------------------------------------------------------------*
*    START = 14:03:16   STOP = 14:10:25    ELAPSED = 00:07:08                  CPU TIME =    210.74                 *
*-------------------------------------------------------------------------------------------------------------*
*    REGION AVAILABLE = 10736K            REGION USED(SYSTEM) =   240K        REGION USED(USER) =   228K           *
```

```
*--------------------------------------------------------------------------------------------------------*
*   PGM PAGES  IN =       321              VIO PAGES  IN =        0              SWAP PAGES  IN =        0       *
*   PGM PAGES OUT =       321              VIO PAGES OUT =        0              SWAP PAGES OUT =        0       *
*                                                                                # SWAPS        =        0       *
*--------------------------------------------------------------------------------------------------------*
*   UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S       UNIT  EXCP'S   *
*    15D  000000        492  000069        152  000000        15A  000004        492  000017        158  000000   *
*    159  000000        159  000000        15A  000000        15D  000000        158  000000        158  001038   *
*    15A  001177        15D  000000                                                                              *
*--------------------------------------------------------------------------------------------------------*
*                                                                                STEP COST =     $18.62          *
*--------------------------------------------------------------------------------------------------------*

IEF237I 15D  ALLOCATED TO SYS00001
IEF285I   SYS78153.T141025.RA000.AF2001H.R0000001       KEPT
IEF285I   VOL SER NOS= USER04.
IEF285I   SYS78153.T134841.RA000.AF2001H.GOSET          DELETED
IEF285I   VOL SER NOS= USER04.
IEF375I  JOB /AF2001H / START 78153.1348
IEF376I  JOB /AF2001H / STOP  78153.1410 CPU    5MIN 29.48SEC SRB    0MIN 20.96SEC
*--------------------------------------------------------------------------------------------------------*
*   HARRY DIAMOND LABORATORIES COMPUTER CENTER -- JOB TERMINATION STATISTICS    OS/VS2 REL 03.7   A168    06/02/78   *
*--------------------------------------------------------------------------------------------------------*
*   JOBNAME = AF2001H                      CLASS = C        ASID =   4          SERVICE =   773500               *
*--------------------------------------------------------------------------------------------------------*
*   START = 13:48:41   STOP = 14:10:25    ELAPSED = 00:21:44                    CPU TIME =     350.44            *
*--------------------------------------------------------------------------------------------------------*
*   # PLOT RECORDS =         0                                                  JOB COST =     $32.52 + PRINT/PUNCH  *
*--------------------------------------------------------------------------------------------------------*

                                   - - -   H O T   N E W S   - - -                            05/26/78
          ****************************************************************************************
          *          THE THREE 3340 WORK PACKS, WORK01, WORK02 AND WORK03, WILL BE              *
          *        REPLACED BY A SINGLE 3350 VOLUME LABELLED WORK50 ON TUESDAY,                 *
          *        30 MAY 1978.  CONCURRENTLY, THREE ADDITIONAL 3340 USER PACKS,                *
          *        LABELLED USER05, USER06 AND USER07, WILL BECOME AVAILABLE.  THE              *
          *        USE ATTRIBUTE OF THE NEW WORK50 VOLUME WILL BE 'STORAGE'.  THE USE           *
          *        ATTRIBUTE OF THE NEW 3340 USER PACKS AND ALL OTHER USER PACKS WILL           *
          *        BE CHANGED TO 'PUBLIC'.                                                      *
          ****************************************************************************************
OUT
GENERATING HULL
TAPE4 SEARCH FOR START CYCLE

STEEL PENETRATOR INTO CONCRETE                                          00002280
```

```
PROB    1.3000  CYCLE     0  TIME 0.0
BACKSPACING    2 RECORDS
TAPE POSITIONED
                DISK VERSION



          ***** OPTIONS SELECTED FOR THIS RUN *****

               DIFFERENCE METHOD -
                                  SHELL II
                                                                AND MATERIAL STRENGTH
                                                                                    WITH 6 FLUXED HISTORIES/CELL
               STATION DATA ROUTINES INCLUDED
               EQUATION OF STATE -
                                  SOLIDS - NO STRENGTH
               ATMOSPHERE -
                            CONSTANT
               VOLUME AND ENERGY FLUXING
               REZONE -
                       NO REZONE
               CODE -
                     HULL
               DIMENSIONS -
                           2-D
               GEOMETRY -
                          CYLINDRICAL
               NO RADIATION ROUTINES
               PARTICLES -
                           CODE INCLUDED
THE FOLLOWING OPTIONS WERE DEFINED BY PLANK.

          ATMOS     =          5
          BURN      =          0
          CODE      =          1
          DIMEN     =          2
          EOS       =          6
          GEOM      =          2
          HOT       =          0
          IMAX      =         20
          ISLAND    =          0
          JMAX      =         40
          KMAX      =          1
          LBUFA     =       1729
          LBUFB     =        122
          MAGFLD    =          0
          METHOD    =          2
          NH        =         20
          NHIC      =       1600
```

```
 NN       =        3
 NOP      =       16
 NHIST    =        6
 NPLPB    =        2
 NPP      =        3
 NROWPB   =        4
 NSTN     =       16
 NVARST   =       16
 RAD      =        0
 REZONE   =        0
 STRESS   =        1
 SURF     =        0
 SW       =        6
 SWX      =        0
 VISC     =        0
 LAMB     =        0■

                                  BBOUND   =        0
 LBOUND   =        0
 KEEL     =        0
 PULL     =        0
 VOIDS    =        0
 FLUXER   =        3
 DEPOS    =        0
 FAIL     =        0
 STRAIN   =        1
 WORK     =        0
 MAT      =        3
 AIR      =        1
 FE       =        2
 CONCRT   =        3

OUT
```

THE FOLLOWING OPTIONS WERE SPECIFIED WHEN EXECUTIVE PROCESSING BEGAN

INST	=	6
PRG	=	0
PLANK	=	0
PULL	=	0
KEEL	=	0
LIBRARY	=	0
ATMOS	=	5
BURN	=	0
CODE	=	1
DIMEN	=	2
EOS	=	6
GEOM	=	2
HOT	=	0
IMAX	=	20
ISLAND	=	0
JMAX	=	40
KMAX	=	1
LBUFA	=	1729
LBUFB	=	122
MAGFLD	=	0
METHOD	=	2
NH	=	20
NHIC	=	1600
NM	=	3
NOP	=	16
NHIST	=	6
NPLPB	=	2
NPP	=	3
NROWPB	=	4
NSTN	=	16
NVARST	=	16
RAD	=	0
REZONE	=	0
STRESS	=	1
SURF	=	0
SW	=	6
SWX	=	0
VISC	=	0
LAMB	=	0
BBOUND	=	0
LBOUND	=	0
VOIDS	=	0
FLUXER	=	3
DEPOS	=	0
FAIL	=	0
STRAIN	=	1
WORK	=	0
MAT	=	3

```
AIR       =          1
FE        =          2
CONCRT    =          3

THE FOLLOWING DEFINITIONS OR REDEFINITIONS WERE MADE DURING EXECUTIVE PROCESSING


SYS       =        370
VER       =          1
OBJLIB    =          1
TAPELIB   =          0
CDC       =          0
IBM       =          1
HX        =          0
CW        =          8
NW        =          2
RDEND     =          1
CARDL     =         10
CARDO     =         80
DOUBLE    =          0
NNEC      =      16000
NBLKS     =         10
NPIC      =         48
NPICMAX   =       3020
STRAIN    =          1
STRESS    =          1
DEBUG     =          0
FILMPR    =          0
D$NAMEA   =         21
D$NAMEB   =         12
D$NAMEB   =         13
D$NAMEB   =         15
D$NAMEB   =         17
D$NAMEC   =         14
D$NAMEC   =         15
D$NAMEC   =         16
D$NAMED   =          5
AIREOS    =          1


    8869 CARDS GENERATED
END OF NORMAL   RUN
 SYSTEM HULL    , VERSION        105
 CREATED 19MAY78

OUT
```

HULL START

PROB 1.3000 STARTUP ON CYCLE 0 TIME 0.0

MATERIAL PROPERTIES DEFINED FOR THIS RUN

MATERIAL	AMBIENT YIELD (Y0)	THERMAL SHOFTENING YLD/Y0	EE/EMELT	WORK HARDENING YIELD	PLASTIC STRAIN
2	4.690E+09	1.00E+00	0.0	4.690E+09	0.0
		9.00E-01	5.00E-01	5.500E+09	3.00E-01
		9.00E-01	5.00E-01		
		0.0	1.00E+00		
3	3.000E+09	1.00E+00	0.0	3.000E+09	0.0
		3.00E+28	-2.23E-67	-5.208E+22	0.59E+17
		0.14E+27	0.19E-19		
		0.0	1.00E+00		

STEEL PENETRATOR INTO CONCRETE 00002280

BLK/ PROB	1.30000D+00	4114CCCC00000000
ATMOS	5.00000D+00	4150000000000000
BREF	0.0	0000000000000000
CODE	1.00000D+00	4110000000000000
COLD	0.0001D-79	0000000100000000
CYCLE	0.0	0000000000000000
DIMEN	2.00000D+00	4120000000000000
DT	1.00000D-08	3A2AF31E00000000
ELC	0.0	0000000000000000
EOS	6.00000D+00	4160000000000000
ETH	0.0	0000000000000000
EXPAND	5.00000D-02	3FCCCCCD00000000
FAIL	0.0	0000000000000000
FLUXER	3.00000D+00	4130000000000000
GEOM	2.00000D+00	4120000000000000
IMAX	2.00000D+01	4214000000000000

IQ	1.90000D+01	4213000000000000
ISLAND	0.0	0000000000000000
JMAX	4.00000D+01	4228000000000000
JQ	3.90000D+01	4227000000000000
MOB	0.0	0000000000000000
LREF	0.00001D-79	0000000100000000
METHOD	2.00000D+00	4120000000000000
MLC	0.0	0000000000000000
MTH	0.0	0000000000000000
NN	2.00000D+01	4214000000000000
NNIC	1.60000D+03	4364000000000000
NNIST	6.00000D+00	4160000000000000
NM	3.00000D+00	4130000000000000
NOP	1.60000D+01	4210000000000000
NPP	3.00000D+00	4130000000000000
NROWPB	4.00000D+00	4140000000000000
NSTN	1.60000D+01	4210000000000000
NVARST	1.60000D+01	4210000000000000
PTSTOP	6.00000D+02	4325800000000000
RADLOS	0.0	0000000000000000
REZONE	0.0	0000000000000000
RREF	0.0	0000000000000000
STABF	5.00000D-01	4080000000000000
STRAIN	1.00000D+00	4110000000000000
STRESS	1.00000D+00	4110000000000000
SUME	0.0	0000000000000000
T	0.0	0000000000000000
TERAD	0.0	0000000000000000
TLC	0.0	0000000000000000
TREF	0.0	0000000000000000
TTIME	0.0	0000000000000000
TTSTOP	1.00000D+02	4264000000000000
UREZ	1.00000D+01	41A0000000000000
VISC	0.0	0000000000000000
VREZ	1.00000D+01	41A0000000000000
VOIDS	0.0	0000000000000000
WORK	0.0	0000000000000000
X1	4.00000D+00	4140000000000000
X2	-1.00000D+00	C110000000000000
XOB	0.0	0000000000000000
Y1	8.00000D+00	4180000000000000
Y2	3.20000D+01	4220000000000000
YBND	0.0	0000000000000000
YIELD	0.0	0000000000000000
AIR	1.00000D+00	4110000000000000
FE	2.00000D+00	4120000000000000
CONCRT	3.00000D+00	4130000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000

```
        0.0             0000000000000000
        0.0             0000000000000000
        0.0             0000000000000000
        0.0             0000000000000000
        0.0             0000000000000000
        0.0             0000000000000000
        0.0             0000000000000000
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        0.0             0000000000000000
        0.0             0000000000000000
        0.0             0000000000000000
        0.0             0000000000000000
        0.0             0000000000000000
        0.0             0000000000000000
        0.0             0000000000000000
NOPT
    MRELER       1.000D+01     41A000010C6F7A0B
    [illegible]  6.000D+02     [illegible]
    DCYCST       1.000D+20     5156BC7600000000
    PRINTW       0.000D-79     00000001780672C0
    DEBUG        0.000D-79     00000000780672C4
    X1NEW        1.500D+01     41F0000000000000
    Y1NEW        5.500D+01     4237000000000000
    Y2NEW        8.500D+01     4255000000000000
    TIMES        3.000D+00     413000010C6F7A0B
    DMPINT       1.000D-06     3C10C6F7BCDBAFF5
    VMIN         1.000D-03     3E41893700000000
    ITRACE       1.476D+09     485800D0B8000000
    JTRACE       1.510D+09     485A00D160000000

**********
**********

PROB    1.3000     CYCLE     0     TIME  0.0           DT  1.000000E-08

   INTERNAL ENERGY         KINETIC ENERGY         TOTAL ENERGY              ETH              REL ERROR
 5.12859885     E+12    5.73509835    E+13    6.24795771    E+13    6.24795771     E+13    0.0
```

TOTAL MASS		MIN		RELMERR
6.43812891	E+03	6.43812891	E+03	0.0

MAX VEL = 0.0 AT I 0 J 0

MAX CS = 0.0 AT I 0 J 0

MAX TEMP= 0.0 AT I 0 J 0

MAX P = 0.0 AT I 0 J 0

CELL SETTING DT, I 0 J 0

TOTAL TIME FOR THIS PROBLEM 0 HOURS, 0 MIN, 0 SEC

TIME FOR THIS RUN 0 HOURS, 0 MIN, 0 SEC

I= 1 X(I)= 0.500 DX(I)= 0.500

J	P	U	V	XI	RHO	SRR	SZZ	SRZ	Y	DY	M	XM	M	XM
1	1.013E+06	0.0	0.0	2.044E+09	1.225E-03	0.0	0.0	0.0	-9.50E+00	5.00E-01	1	4.81055E-04		
2	1.013E+06	0.0	0.0	2.044E+09	1.225E-03	0.0	0.0	0.0	-9.00E+00	5.00E-01	1	4.81055E-04		
3	1.013E+06	0.0	0.0	2.044E+09	1.225E-03	0.0	0.0	0.0	-8.50E+00	5.00E-01	1	4.81055E-04		
4	1.013E+06	0.0	0.0	2.044E+09	1.225E-03	0.0	0.0	0.0	-8.00E+00	5.00E-01	1	4.81055E-04		
5	-2.017E+06	0.0	7.62E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	-7.50E+00	5.00E-01	2	3.08661E+00		
6	-2.017E+06	0.0	7.62E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	-7.00E+00	5.00E-01	2	3.08661E+00		
7	-2.017E+06	0.0	7.62E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	-6.50E+00	5.00E-01	2	3.08661E+00		
8	-2.017E+06	0.0	7.62E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	-6.00E+00	5.00E-01	2	3.08661E+00		
9	-2.017E+06	0.0	7.62E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	-5.50E+00	5.00E-01	2	3.08661E+00		
10	-2.017E+06	0.0	7.62E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	-5.00E+00	5.00E-01	2	3.08661E+00		
11	-2.017E+06	0.0	7.62E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	-4.50E+00	5.00E-01	2	3.08661E+00		
12	-2.017E+06	0.0	7.62E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	-4.00E+00	5.00E-01	2	3.08661E+00		
13	-2.017E+06	0.0	7.62E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	-3.50E+00	5.00E-01	2	3.08661E+00		
14	-2.017E+06	0.0	7.62E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	-3.00E+00	5.00E-01	2	3.08661E+00		
15	-2.017E+06	0.0	7.62E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	-2.50E+00	5.00E-01	2	3.08661E+00		
16	-2.017E+06	0.0	7.62E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	-2.00E+00	5.00E-01	2	3.08661E+00		
17	-2.017E+06	0.0	7.62E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	-1.50E+00	5.00E-01	2	3.08661E+00		
18	-2.017E+06	0.0	7.62E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	-1.00E+00	5.00E-01	2	3.08661E+00		
19	-2.017E+06	0.0	7.62E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	-5.00E-01	5.00E-01	2	3.08661E+00		
20	-2.017E+06	0.0	7.62E+05	1.268E+09	7.860E+00	0.0	0.0	0.0	-9.54E-07	5.00E-01	2	3.08661E+00		
21	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	5.00E-01	5.00E-01	3	8.63937E-01		
22	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	1.00E+00	5.00E-01	3	8.63937E-01		
23	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	1.50E+00	5.00E-01	3	8.63937E-01		
24	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	2.00E+00	5.00E-01	3	8.63937E-01		
25	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	2.50E+00	5.00E-01	3	8.63937E-01		
26	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	3.00E+00	5.00E-01	3	8.63937E-01		
27	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	3.50E+00	5.00E-01	3	8.63937E-01		
28	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	4.00E+00	5.00E-01	3	8.63937E-01		
29	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	4.50E+00	5.00E-01	3	8.63937E-01		
30	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	5.00E+00	5.00E-01	3	8.63937E-01		
31	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	5.50E+00	5.00E-01	3	8.63937E-01		

32	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	6.00E+00	5.00E-01	3	8.63937E-01
33	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	6.50E+00	5.00E-01	3	8.63937E-01
34	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	7.00E+00	5.00E-01	3	8.63937E-01
35	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	7.50E+00	5.00E-01	3	8.63937E-01
36	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	8.00E+00	5.00E-01	3	8.63937E-01
37	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	8.50E+00	5.00E-01	3	8.63937E-01
38	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	9.00E+00	5.00E-01	3	8.63937E-01
39	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	9.50E+00	5.00E-01	3	8.63937E-01
40	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	1.00E+01	5.00E-01	3	8.63937E-01

MATERIAL MAP

```
          1         2
                                ALTITUDE
  12345678901234567890
                                 METERS
 1 ++++++++++++++++++++ -9.500E-02
 2 ++++++++++++++++++++ -9.000E-02
 3 ++++++++++++++++++++ -8.500E-02
 4 ++++++++++++++++++++ -8.000E-02
 5 XX++++++++++++++++++ -7.500E-02
   L
 6 XX++++++++++++++++++ -7.000E-02
 7 XX++++++++++++++++++ -6.500E-02
   L
 8 XX++++++++++++++++++ -6.000E-02
 9 XX++++++++++++++++++ -5.500E-02
10 XX++++++++++++++++++ -5.000E-02
11 XX++++++++++++++++++ -4.500E-02
   L
12 XX++++++++++++++++++ -4.000E-02
13 XX++++++++++++++++++ -3.500E-02
14 XX++++++++++++++++++ -3.000E-02
15 XX++++++++++++++++++ -2.500E-02
   L
16 XX++++++++++++++++++ -2.000E-02
17 XX++++++++++++++++++ -1.500E-02
18 XX++++++++++++++++++ -1.000E-02
19 XX++++++++++++++++++ -5.000E-03
   L
20 XX++++++++++++++++++ -9.537E-09
21 00000000000000000000  5.000E-03
   L
22 00000000000000000000  1.000E-02
   L
23 00000000000000000000  1.500E-02
   L
24 00000000000000000000  2.000E-02
25 00000000000000000000  2.500E-02
   L
26 00000000000000000000  3.000E-02
```

```
 27 00000000000000000000  3.500E-02
    L
 28 00000000000000000000  4.000E-02
 29 00000000000000000000  4.500E-02
    L
 30 00000000000000000000  5.000E-02
 31 00000000000000000000  5.500E-02
    L
 32 00000000000000000000  6.000E-02
 33 00000000000000000000  6.500E-02
    L
 34 00000000000000000000  7.000E-02
 35 00000000000000000000  7.500E-02
    L
 36 00000000000000000000  8.000E-02
 37 00000000000000000000  8.500E-02
    L
 38 00000000000000000000  9.000E-02
 39 00000000000000000000  9.500E-02
    L
 40 00000000000000000000  1.000E-01
    12345678901234567890
              1         2
   CYCLE     1   TIME 1.0000E-08  DT 4.088E-08   IDT    1  JDT    5
   CYCLE     2   TIME 5.0885E-08  DT 6.114E-08   IDT    1  JDT   20
   CYCLE     3   TIME 1.1203E-07  DT 8.059E-08   IDT    1  JDT   20
   CYCLE     4   TIME 1.9261E-07  DT 9.927E-08   IDT    2  JDT   20
   CYCLE     5   TIME 2.9189E-07  DT 1.174E-07   IDT    2  JDT   20
   CYCLE     6   TIME 4.0931E-07  DT 1.354E-07   IDT    2  JDT   20
   CYCLE     7   TIME 5.4470E-07  DT 1.537E-07   IDT    2  JDT   20
IHO208I IBCOM - PROGRAM INTERRUPT (P) -  UNDERFLOW   OLD PSW IS  078D000DA20899AE . REGSTER CONTAINED   75118260
TRACEBACK  ROUTINE  CALLED FROM ISN   REG.  14   REG.  15   REG.   0   REG.   1
           STATE                      62076ABA   00088FD0   00000009   000768E4
           EOSSET                     42075BA6   00076870   00000019   00000000
           MAIN                       00008858   00075538   00AED078   00074FF0
ENTRY POINT=  00075538
STANDARD FIXUP TAKEN , EXECUTION CONTINUING
IHO208I IBCOM - PROGRAM INTERRUPT (P) -  UNDERFLOW   OLD PSW IS  078D000DA20899AE . REGISTER CONTAINED   75118260
TRACEBACK  ROUTINE  CALLED FROM ISN   REG.  14   REG.  15   REG.   0   REG.   1
           STATE                      62078BC0   00088FD0   00000024   00077624
           HYDRO                      42075D8E   00077530   00000019   00000000
           MAIN                       00008858   00075538   00AED078   00074FF0
ENTRY POINT=  00075538
STANDARD FIXUP TAKEN , EXECUTION CONTINUING
   CYCLE     8   TIME 6.9836E-07  DT 1.659E-07   IDT    2  JDT   20
IHO208I IBCOM - PROGRAM INTERRUPT (P) -  UNDERFLOW   OLD PSW IS  078D000DA20899AE . REGISTER CONTAINED   773D2BA4
TRACEBACK  ROUTINE  CALLED FROM ISN   REG.  14   REG.  15   REG.   0   REG.   1
           STATE                      62076ABA   00088FD0   00000009   000768E4
           EOSSET                     42075BA6   00076870   00000023   00000000
           MAIN                       00008858   00075538   00AED078   00074FF0
ENTRY POINT=  00075538
```

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STANDARD FIXUP TAKEN , EXECUTION CONTINUING
IHD208I IBCOM - PROGRAM INTERRUPT (P) -  UNDERFLOW   OLD PSW IS  078D000DA20899AE . REGISTER CONTAINED   773D2BA4
TRACEBACK  ROUTINE  CALLED FROM ISN   REG.  14   REG.  15   REG.   0   REG.   1
           STATE                      620783C0   00088FD0   00000024   00077624
           HYDRO                      42075D8E   00077530   00000023   00000000
           MAIN                       00008858   00075538   00AED078   00074FF0
ENTRY POINT=  00075538
STANDARD FIXUP TAKEN , EXECUTION CONTINUING
   CYCLE     9   TIME 8.6426E-07  DT 1.357E-07   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   5.3425229E+08 XI(N+1)=  -1.7518715E+08 KE(N+1)=   5.1168940E+06
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   5.3442099E+08 XI(N+1)=  -1.7543890E+08 KE(N+1)=   5.3100000E+06
NEG ENERGY AT I=   1 J=   4
P=  8.16855000       E+04 U=  0.0                    V=  2.43006349       E-01
XI= -1.69173600       E+08 XM=  1.45382452       E-04
XM=  1.45382466       E-04  0.0                    0.0
NEG ENERGY AT I=   2 J=   4
P=  8.17724375       E+04 U= -3.23420405       E-01 V=  2.41543949       E-01
XI= -1.68040080       E+08 XM=  4.36691567       E-04
XM=  4.36692033       E-04  0.0                    0.0
   CYCLE    10   TIME 1.0000E-06  DT 1.386E-07   IDT    2  JDT   21


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**********

PROB    1.3000     CYCLE    10     TIME  9.999994E-07     DT  1.385681E-07

    INTERNAL ENERGY          KINETIC ENERGY          TOTAL ENERGY                ETH                 REL ERROR
  6.67096816      E+12    5.58082346      E+13    6.24791912      E+13    6.24795771      E+13   -6.17603683      E+00

                                                      TOTAL MASS                 MTH                 RELMERR
                                                    6.43812500      E+03    6.43812891      E+03   -6.06737196      E-01

MAX VEL =  7.62004E+05 AT I   2 J  12

MAX CS =   6.64689E+05 AT I   2 J  21

MAX TEMP=   1.81835E+04 AT I   3 J  21

MAX P =   4.98883E+11 AT I   2 J  21

CELL SETTING DT, I   2 J  21


TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN, 22 SEC

TIME FOR THIS RUN     0 HOURS,  0 MIN, 22 SEC
WHIZ FACTOR TOTAL PROBLEM    = 2.78E-03 SEC/CELL/CYCLE
WHIZ FACTOR SINCE LAST DUMP = 2.67E-03 SEC/CELL/CYCLE
```

I= 1	X(I)= 0.500	DX(I)= 0.500												
J	P	U	V	XI	RHO	SRR	SZZ	SRZ	Y	DY	M	XM	M	XM
1	1.013E+06	0.0	0.0	2.044E+09	1.225E-03	0.0	0.0	0.0	-9.50E+00	5.00E-01	1	4.81055E-04		
2	1.013E+06	-5.90E-10	1.08E-01	2.044E+09	1.225E-03	0.0	0.0	0.0	-9.00E+00	5.00E-01	1	4.80936E-04		
3	1.013E+06	-8.44E-10	6.00E+02	2.044E+09	1.225E-03	0.0	0.0	0.0	-8.50E+00	5.00E-01	1	4.81016E-04		
4	1.538E+04	0.0	2.43E-01	1.000E+08	3.702E-04	0.0	0.0	0.0	-8.00E+00	5.00E-01	1	1.45382E-04		
5	6.924E+06	-3.36E+00	5.48E+05	5.779E+10	5.296E-04	0.0	0.0	0.0	-7.50E+00	5.00E-01	1	2.07972E-04		
6	6.099E+06	1.53E+00	7.62E+05	1.296E+09	3.743E+00	-7.15E+06	1.68E+07	0.0	-7.00E+00	5.00E-01	1	1.27726E-04	2	1.46974E+00
7	-1.474E+07	1.53E+00	7.62E+05	1.281E+09	7.859E+00	-9.42E+06	2.34E+07	6.13E+05	-6.50E+00	5.00E-01	2	3.08626E+00		
8	-1.843E+06	1.80E+00	7.62E+05	1.273E+09	7.860E+00	-5.38E+06	1.48E+07	1.22E+06	-6.00E+00	5.00E-01	2	3.08648E+00		
9	2.309E+07	1.96E+00	7.62E+05	1.271E+09	7.860E+00	-1.31E+06	4.01E+06	1.78E+06	-5.50E+00	5.00E-01	2	3.08658E+00		
10	3.255E+07	1.79E+00	7.62E+05	1.271E+09	7.860E+00	5.97E+04	-2.46E+05	2.50E+06	-5.00E+00	5.00E-01	2	3.08661E+00		
11	2.945E+07	1.59E+00	7.62E+05	1.270E+09	7.860E+00	6.15E+05	-9.17E+05	3.33E+06	-4.50E+00	5.00E-01	2	3.08662E+00		
12	2.911E+07	1.65E+00	7.62E+05	1.271E+09	7.860E+00	9.64E+05	-5.73E+05	3.77E+06	-4.00E+00	5.00E-01	2	3.08661E+00		
13	3.307E+07	1.79E+00	7.62E+05	1.271E+09	7.860E+00	1.08E+06	-2.24E+05	3.85E+06	-3.50E+00	5.00E-01	2	3.08660E+00		
14	2.963E+07	1.92E+00	7.62E+05	1.271E+09	7.860E+00	8.00E+05	-4.40E+05	3.87E+06	-3.00E+00	5.00E-01	2	3.08660E+00		
15	2.928E+07	1.98E+00	7.62E+05	1.271E+09	7.860E+00	1.09E+06	-1.58E+05	3.84E+06	-2.50E+00	5.00E-01	2	3.08660E+00		
16	1.079E+08	1.90E+00	7.62E+05	1.271E+09	7.860E+00	8.28E+06	-1.49E+07	3.83E+06	-2.00E+00	5.00E-01	2	3.08674E+00		
17	2.147E+08	4.57E+00	7.62E+05	1.270E+09	7.861E+00	3.82E+07	-3.04E+07	3.67E+06	-1.50E+00	5.00E-01	2	3.08696E+00		
18	5.216E+09	4.03E+00	7.62E+05	1.272E+09	7.884E+00	8.08E+08	-1.59E+09	2.77E+07	-1.00E+00	5.00E-01	2	3.09610E+00		
19	1.457E+10	2.84E+02	7.54E+05	1.326E+09	7.924E+00	2.47E+09	-2.89E+09	4.24E+07	-5.00E-01	5.00E-01	2	3.11180E+00		
20	1.586E+11	5.35E+02	7.38E+05	3.191E+09	8.414E+00	1.66E+09	-3.03E+09	5.92E+06	-9.54E-07	5.00E-01	2	3.30404E+00		
21	5.304E+11	1.03E+03	6.54E+05	1.077E+10	9.245E+00	1.20E+09	-2.50E+09	-1.46E+06	5.00E-01	5.00E-01	2	3.63057E+00		
22	4.810E+11	9.74E+02	4.28E+05	1.272E+11	5.236E+00	1.08E+09	-2.21E+09	0.0	1.00E+00	5.00E-01	2	6.36342E-01	3	1.41968E+00
23	5.570E+10	1.76E+02	9.38E+04	4.167E+10	2.822E+00	3.60E+09	-7.05E+09	1.81E+06	1.50E+00	5.00E-01	3	1.10810E+00		
24	1.767E+09	1.33E+01	3.46E+03	1.166E+09	2.245E+00	6.34E+08	-1.21E+09	-1.21E+06	2.00E+00	5.00E-01	3	8.81561E-01		
25	9.338E+07	9.40E-01	1.38E+02	7.811E+08	2.201E+00	2.15E+07	-3.75E+07	-1.03E+05	2.50E+00	5.00E-01	3	8.64492E-01		
26	5.033E+06	7.38E-02	4.55E+00	7.810E+08	2.200E+00	7.75E+05	-1.35E+06	-5.16E+03	3.00E+00	5.00E-01	3	8.63962E-01		
27	8.835E+05	4.33E-02	1.62E-01	7.810E+08	2.200E+00	2.25E+04	-3.66E+04	-6.32E+02	3.50E+00	5.00E-01	3	8.63937E-01		
28	7.644E+05	4.29E-02	3.19E-03	7.810E+08	2.200E+00	9.62E+03	-1.42E+03	-5.53E+00	4.00E+00	5.00E-01	3	8.63936E-01		
29	7.544E+05	4.29E-02	1.38E-12	7.810E+08	2.200E+00	9.62E+03	-8.09E-06	1.19E-01	4.50E+00	5.00E-01	3	8.63936E-01		
30	7.544E+05	4.29E-02	0.0	7.810E+08	2.200E+00	9.62E+03	0.0	0.0	5.00E+00	5.00E-01	3	8.63936E-01		
31	7.544E+05	4.29E-02	0.0	7.810E+08	2.200E+00	9.62E+03	0.0	0.0	5.50E+00	5.00E-01	3	8.63936E-01		
32	7.544E+05	4.29E-02	0.0	7.810E+08	2.200E+00	9.62E+03	0.0	0.0	6.00E+00	5.00E-01	3	8.63936E-01		
33	7.544E+05	4.29E-02	0.0	7.810E+08	2.200E+00	9.62E+03	0.0	0.0	6.50E+00	5.00E-01	3	8.63936E-01		
34	7.544E+05	4.29E-02	0.0	7.810E+08	2.200E+00	9.62E+03	0.0	0.0	7.00E+00	5.00E-01	3	8.63936E-01		
35	7.544E+05	4.29E-02	0.0	7.810E+08	2.200E+00	9.62E+03	-6.68E-18	-1.20E-03	7.50E+00	5.00E-01	3	8.63936E-01		
36	7.544E+05	4.29E-02	0.0	7.810E+08	2.200E+00	9.62E+03	0.0	0.0	8.00E+00	5.00E-01	3	8.66fE-01		
37	7.544E+05	4.29E-02	0.0	7.810E+08	2.200E+00	9.62E+03	-3.09E-07	-4.34E+00	8.50E+00	5.00E-01	3	8.63936E-01		
38	7.544E+05	4.26E-02	-1.45E-11	7.810E+08	2.200E+00	9.60E+03	-3.74E+02	-4.82E-06	9.00E+00	5.00E-01	3	8.63936E-01		
39	7.544E+05	4.29E-02	-1.03E-02	7.810E+08	2.200E+00	9.62E+03	5.26E-05	-1.90E+03	9.50E+00	5.00E-01	3	8.63936E-01		
40	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	1.00E+01	5.00E-01	3	8.63937E-01		

ENERGY MAP

1 2

ALTITUDE

```
   12345678901234567890
                                METERS
 1                          -9.500E-02
 2                          -9.000E-02
 3                          -8.500E-02
 4                          -8.000E-02
 5 BBBBB                    -7.500E-02
 6 TTTTT                    -7.000E-02
   L
 7    B                     -6.500E-02
 8   B B                    -6.000E-02
   L
 9                          -5.500E-02
10                          -5.000E-02
11  B                       -4.500E-02
*12 BL                      -4.000E-02
13  T                       -3.500E-02
14 T                        -3.000E-02
15  B T                     -2.500E-02
16 B  B                     -2.000E-02
   L
17 T  TT                    -1.500E-02
18 B  BBB                   -1.000E-02
19   TTTTB BBBB             -5.000E-03
20    BBB B TTT             -9.537E-09
   L
21   BTTTTTT                 5.000E-03
   L
22   T   BBBBBB             1.000E-02
n   L
23 TT   B                   1.500E-02
   L
24     B  T                 2.000E-02
25    B                     2.500E-02
   L
26                          3.000E-02
27 B                        3.500E-02
   L
28                          4.000E-02
29                          4.500E-02
   L
30                          5.000E-02
31                          5.500E-02
   L
32                          6.000E-02
33                          6.500E-02
   L
34                          7.000E-02
35                          7.500E-02
   L
36                          8.000E-02
```



```
37                          8.500E-02
   L
38                          9.000E-02
39                          9.500E-02
   L
40  BB    B    BBBBBBBB     1.000E-01
   1234■6789012345678 90
            1         2
```

MATERIAL MAP

```
            1         2
                              ALTITUDE
   12345678901234567890
                                METERS
 1 +++++++++++++++++++++ -9.500E-02
 2 +++++++++++++++++++++ -9.000E-02
 3 +++++++++++++++++++++ -8.500E-02
 4 +++++++++++++++++++++ -8.000E-02
 5 +++++++++++++++++++++ -7.500E-02
 6 +++++++++++++++++++++ -7.000E-02
   L
   XX
 7 X+++++++++++++++++++ -6.500E-02
    X
 8 X+++++++++++++++++++ -6.000E-02
   L
    X
 9 X+++++++++++++++++++ -5.500E-02
    X
10 X+++++++++++++++++++ -5.000E-02
    X
11 X+++++++++++++++++++ -4.500E-02
    X
12 XX++++++++++++++++++ -4.000E-02
   L
     X
13 XX++++++++++++++++++ -3.500E-02
     X
14 XX++++++++++++++++++ -3.000E-02
     X
15 XX++++++++++++++++++ -2.500E-02
     X
16 XX++++++++++++++++++ -2.000E-02
   L
     X
17 XX++++++++++++++++++ -1.500E-02
     X
18 XX++++++++++++++++++ -1.000E-02
     X
19 XX++++++++++++++++++ -5.000E-03
```

```
    A
 20 XX+++++++++++++++++++ -9.537E-09
    L
      XOOO
 21 XX++OO+++++++++++++++  5.000E-03
    L
      XO  OOOOOOOOOOOOOOO
      O
 22 XXOOOOOOOOOOOOOOOOOO  1.000E-02
    L
    OO
 23 OOOOOOOOOOOOOOOOOOOO  1.500E-02
    L
 24 OOOOOOOOOOOOOOOOOOOO  2.000E-02
 25 OOOOOOOOOOOOOOOOOOOO  2.500E-02
    L
 26 OOOOOOOOOOOOOOOOOOOO  3.000E-02
 27 OOOOOOOOOOOOOOOOOOOO  3.500E-02
    L
 28 OOOOOOOOOOOOOOOOOOOO  4.000E-02
 29 OOOOOOOOOOOOOOOOOOOO  4.500E-02
    L
 30 OOOOOOOOOOOOOOOOOOOO  5.000E-02
 31 OOOOOOOOOOOOOOOOOOOO  5.500E-02
    L
 32 OOOOOOOOOOOOOOOOOOOO  6.000E-02
 33 OOOOOOOOOOOOOOOOOOOO  6.500E-02
    L
 34 OOOOOOOOOOOOOOOOOOOO  7.000E-02
 35 OOOOOOOOOOOOOOOOOOOO  7.500E-02
    L
 36 OOOOOOOOOOOOOOOOOOOO  8.000E-02
 37 OOOOOOOOOOOOOOOOOOOO  8.500E-02
    L
 38 OOOOOOOOOOOOOOOOOOOO  9.000E-02
 39 OOOOOOOOOOOOOOOOOOOO  9.500E-02
    L
 40 OOOOOOOOOOOOOOOOOOOO  1.000E-01
    12345678901234567890
              1         2
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   9.9999904E+07 XI(N+1)=  -5.8750054E+08 KE(N+1)=   1.9071220E+06
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   1.0000000E+08 XI(N+1)=  -5.8741888E+08 KE(N+1)=   1.9243610E+06
NEG ENERGY AT I=   1 J=   4
P=  1.41264180       E+04 U=  0.0                    V=  4.58243191       E-01
XI= -5.84034560       E+08 XM=  1.33564288       E-04
XM=  1.33564288       E-04  0.0                    0.0
NEG ENERGY AT I=   2 J=   4
P=  1.41475742       E+04 U= -6.09365821       E-01 V=  4.52145576       E-01
XI= -5.81867520       E+08 XM=  4.01515514       E-04
XM=  4.01515514       E-04  0.0                    0.0
   CYCLE    11   TIME 1.1386E-06  DT 1.083E-07   IDT    2  JDT   21
```

```
0**********
*        *
* RTSTOP *
*        *
**********


**********
**********

PROB    1.3000     CYCLE   104     TIME  3.460669E-06     DT  4.797723E-08
```


INTERNAL ENERGY		KINETIC ENERGY		TOTAL ENERGY		ETH		REL ERROR	
1.03060760	E+13	5.21732662	E+13	6.24793422	E+13	6.24795771	E+13	-1.16579037	E+01

TOTAL MASS		MTH		RELMERR	
6.43812109	E+03	6.43812891	E+03	-1.31707287	E+00

```
MAX VEL =  7.61969E+05 AT I   2 J  13

MAX CS =   6.54954E+05 AT I   2 J  25
```

MAX TEMP= 1.84968E+04 AT I 3 J 21

MAX P = 4.00484E+11 AT I 2 J 25

CELL SETTING DT, I 2 J 20

TOTAL TIME FOR THIS PROBLEM 0 HOURS, 3 MIN, 36 SEC

TIME FOR THIS RUN 0 HOURS, 3 MIN, 36 SEC

OWHIZ FACTOR TOTAL PROBLEM = 2.60E-03 SEC/CELL/CYCLE

OWHIZ FACTOR SINCE LAST DUMP = 2.63E-03 SEC/CELL/CYCLE

OI= 1 X(I)= 0.500 DX(I)= 0.500

O J	P	U	V	XI	RHO	SRR	SZZ	SRZ	Y	DY	M	XM	M	XM
1	1.013E+06	0.0	0.0	2.044E+09	1.225E-03	0.0	0.0	0.0	-9.50E+00	5.00E-01	1	4.81055E-04		
2	1.005E+06	1.04E-03	5.17E+00	2.039E+09	1.218E-03	0.0	0.0	0.0	-9.00E+00	5.00E-01	1	4.78240E-04		
3	1.007E+06	-1.97E-06	3.97E+03	2.039E+09	1.220E-03	0.0	0.0	0.0	-8.50E+00	5.00E-01	1	4.79188E-04		
4	1.615E+03	1.30E+00	-8.51E+02	2.262E+07	1.717E-04	0.0	0.0	0.0	-8.00E+00	5.00E-01	1	6.74388E-05		
5	1.231E+06	6.85E+01	2.05E+05	4.745E+10	1.123E-04	0.0	0.0	0.0	-7.50E+00	5.00E-01	1	4.41102E-05		
6	1.941E+06	2.84E+01	3.91E+05	6.826E+10	1.380E-04	0.0	0.0	0.0	-7.00E+00	5.00E-01	1	5.41771E-05		
7	2.744E+06	-8.73E+00	5.44E+05	7.260E+10	1.831E-04	0.0	0.0	0.0	-6.50E+00	5.00E-01	1	7.18963E-05		
8	3.504E+06	-3.61E+00	6.61E+05	7.004E+10	2.392E-04	0.0	0.0	0.0	-6.00E+00	5.00E-01	1	9.39376E-05		

9	4.182E+06	2.76E+01	7.43E+05	6.720E+10	2.933E-04	0.0	0.0	0.0	-5.50E+00	5.00E-01	1	1.15171E-04	
10	4.308E+06	5.19E+01	7.62E+05	1.307E+09	5.709E+00	1.62E+07	3.00E+07	0.0	-5.00E+00	5.00E-01	1	3.26304E-05	2 2.24184E+00
11	1.578E+07	5.60E+01	7.62E+05	1.303E+09	7.858E+00	2.75E+07	1.65E+07	2.55E+07	-4.50E+00	5.00E-01	2	3.08579E+00	
12	1.736E+07	5.70E+01	7.62E+05	1.300E+09	7.858E+00	3.66E+07	1.31E+04	3.55E+07	-4.00E+00	5.00E-01	2	3.08588E+00	
13	5.437E+07	5.96E+01	7.62E+05	1.298E+09	7.858E+00	5.07E+07	-2.41E+07	4.21E+07	-3.50E+00	5.00E-01	2	3.08599E+00	
14	1.721E+08	6.17E+01	7.62E+05	1.299E+09	7.859E+00	7.42E+07	-7.74E+07	4.90E+07	-3.00E+00	5.00E-01	2	3.08619E+00	
15	4.391E+08	5.99E+01	7.62E+05	1.297E+09	7.860E+00	1.42E+08	-2.28E+08	5.56E+07	-2.50E+00	5.00E-01	2	3.08672E+00	
16	1.145E+09	5.69E+01	7.62E+05	1.297E+09	7.864E+00	3.78E+08	-7.02E+08	6.30E+07	-2.00E+00	5.00E-01	2	3.08803E+00	
17	3.129E+09	5.56E+01	7.61E+05	1.300E+09	7.873E+00	1.15E+09	-2.21E+09	3.80E+07	-1.50E+00	5.00E-01	2	3.09161E+00	
18	8.829E+09	1.29E+01	7.59E+05	1.312E+09	7.899E+00	1.60E+09	-3.12E+09	-4.02E+07	-1.00E+00	5.00E-01	2	3.10174E+00	
19	2.326E+10	-2.88E+01	7.54E+05	1.402E+09	7.959E+00	1.58E+09	-3.12E+09	-7.21E+07	-5.00E-01	5.00E-01	2	3.12551E+00	
20	4.809E+10	-4.93E+01	7.42E+05	1.844E+09	8.043E+00	1.56E+09	-3.09E+09	3.06E+07	-9.54E-07	5.00E-01	2	3.15844E+00	
21	7.921E+10	1.34E+03	7.20E+05	3.246E+09	8.095E+00	1.51E+09	-3.02E+09	1.18E+08	5.00E-01	5.00E-01	2	3.17904E+00	
22	1.093E+11	4.23E+03	6.83E+05	5.756E+09	8.079E+00	1.44E+09	-2.89E+09	6.80E+07	1.00E+00	5.00E-01	2	3.17269E+00	
23	1.120E+11	5.60E+03	6.21E+05	8.196E+09	7.952E+00	1.18E+09	-2.35E+09	-4.24E+07	1.50E+00	5.00E-01	2	3.12288E+00	
24	2.207E+11	3.12E+03	5.55E+05	3.771E+10	6.640E+00	1.35E+09	-2.67E+09	0.0	2.00E+00	5.00E-01	2	2.06195E+00	3 5.45735E-01
25	3.579E+11	-6.10E+03	4.33E+05	1.308E+11	4.133E+00	3.53E+09	-7.05E+09	-5.59E+07	2.50E+00	5.00E-01	3	1.62316E+00	
26	1.959E+11	-5.56E+03	2.46E+05	7.607E+10	3.614E+00	3.56E+09	-7.05E+09	2.67E+08	3.00E+00	5.00E-01	3	1.41933E+00	
27	2.185E+10	-1.05E+03	6.34E+04	1.486E+10	2.644E+00	3.59E+09	-7.05E+09	2.61E+08	3.50E+00	5.00E-01	3	1.03848E+00	
28	1.974E+09	-4.52E+01	4.89E+03	1.035E+09	2.251E+00	7.44E+08	-1.47E+09	2.25E+07	4.00E+00	5.00E-01	3	8.83838E-01	
29	2.043E+08	8.06E-02	4.50E+02	7.816E+08	2.203E+00	9.53E+07	-1.86E+08	1.73E+06	4.50E+00	5.00E-01	3	8.65158E-01	
30	1.937E+07	-2.24E-02	4.36E+01	7.810E+08	2.200E+00	8.67E+06	-1.71E+07	3.58E+04	5.00E+00	5.00E-01	3	8.64048E-01	
31	2.084E+06	-6.83E-03	3.84E+00	7.810E+08	2.200E+00	7.16E+05	-1.52E+06	1.51E+03	5.50E+00	5.00E-01	3	8.63944E-01	
32	6.254E+05	9.68E-02	2.81E-01	7.810E+08	2.200E+00	8.23E+04	-1.52E+05	5.15E+03	6.00E+00	5.00E-01	3	8.63936E-01	
33	5.658E+05	1.47E-01	1.20E-02	7.810E+08	2.200E+00	5.89E+04	-1.05E+04	1.17E+03	6.50E+00	5.00E-01	3	8.63935E-01	

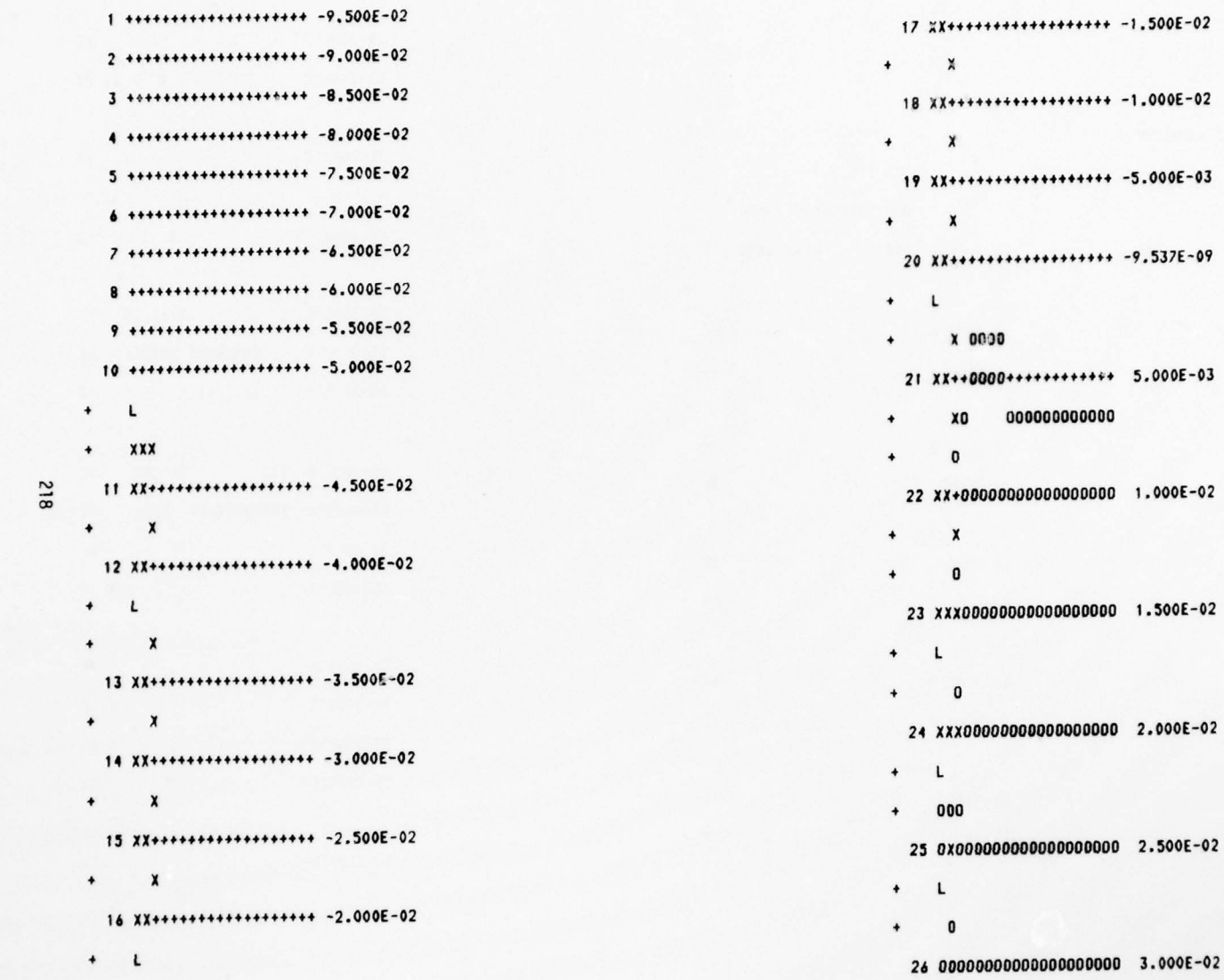
34	5.658E+05	1.51E-01	6.32E-12	7.810E+08	2.200E+00	5.90E+04	-1.91E+02	5.16E+01	7.00E+00	5.00E-01	3	8.63935E-01
35	5.658E+05	1.51E-01	0.0	7.810E+08	2.200E+00	5.90E+04	5.06E+02	-5.18E+01	7.50E+00	5.00E-01	3	8.63935E-01
36	5.658E+05	1.50E-01	1.30E-02	7.810E+08	2.200E+00	5.89E+04	-2.64E+02	-7.85E+02	8.00E+00	5.00E-01	3	8.63935E-01
37	4.963E+05	1.34E-01	-9.66E-03	7.810E+08	2.200E+00	5.66E+04	6.12E+03	-4.31E+03	8.50E+00	5.00E-01	3	8.63935E-01
38	5.857E+05	8.08E-02	3.89E-02	7.810E+08	2.200E+00	5.22E+04	-5.35E+04	-1.11E+04	9.00E+00	5.00E-01	3	8.63935E-01
39	4.368E+05	2.97E-02	-2.04E-01	7.810E+08	2.200E+00	2.98E+04	-6.62E+03	5.17E+03	9.50E+00	5.00E-01	3	8.63934E-01
40	8.140E+05	0.0	0.0	7.810E+08	2.200E+00	0.0	0.0	0.0	1.00E+01	5.00E-01	3	8.63937E-01

0 ENERGY MAP

```
                1         2
+                        ALTITUDE
     12345678901234567890
+                        METERS
   1                   -9.500E-02
   2                   -9.000E-02
   3 BBBB              -8.500E-02
   4 TTTTBB            -8.000E-02
   5 BBBB              -7.500E-02
   6    TTT            -7.000E-02
   7   T               -6.500E-02
   8 TT                -6.000E-02
   9     B             -5.500E-02
  10   BB              -5.000E-02
+   L
  11      B            -4.500E-02
```

```
  12                        -4.000E-02
+   L
  13       B                -3.500E-02
  14 B                      -3.000E-02
  15 T                      -2.500E-02
  16                        -2.000E-02
+   L
  17 BBT                    -1.500E-02
  18        B               -1.000E-02
  19    TTTT  BBBBBBBBBBB   -5.000E-03
  20    BB  TB        TTT   -9.537E-09
+   L
  21   BTT   TTTTTTTTT      5.000E-03
  22   TBBBBB BBBBBBBB      1.000E-02
  23   BT TTTBT             1.500E-02
+   L
  24     T  B               2.000E-02
+   L
  25   T                    2.500E-02
+   L
  26 TT    B T               3.000E-02
  27      B                 3.500E-02
+   L
  28     B T                4.000E-02
  29    B T                 4.500E-02
+   L
  30     T                  5.000E-02
  31 B  T                   5.500E-02
+   L
  32                        6.000E-02
  33                        6.500E-02
+   L
  34                        7.000E-02
  35                        7.500E-02
+   L
  36                        8.000E-02
  37                        8.500E-02
+   L
  38 T      T               9.000E-02
  39 B    B                 9.500E-02
+   L
  40  BBBB BBBB       BBB  1.000E-01
     12345678901234567890
               1         2
0                                        MATERIAL MAP


               1         2
+                              ALTITUDE
     12345678901234567890
+                              METERS
```


1 ++++++++++++++++++++ -9.500E-02
2 ++++++++++++++++++++ -9.000E-02
3 ++++++++++++++++++++ -8.500E-02
4 ++++++++++++++++++++ -8.000E-02
5 ++++++++++++++++++++ -7.500E-02
6 ++++++++++++++++++++ -7.000E-02
7 ++++++++++++++++++++ -6.500E-02
8 ++++++++++++++++++++ -6.000E-02
9 ++++++++++++++++++++ -5.500E-02
10 ++++++++++++++++++++ -5.000E-02
L
XXX
11 XX++++++++++++++++++ -4.500E-02
X
12 XX++++++++++++++++++ -4.000E-02
L
X
13 XX++++++++++++++++++ -3.500E-02
X
14 XX++++++++++++++++++ -3.000E-02
X
15 XX++++++++++++++++++ -2.500E-02
X
16 XX++++++++++++++++++ -2.000E-02
L
X
17 XX++++++++++++++++++ -1.500E-02
X
18 XX++++++++++++++++++ -1.000E-02
X
19 XX++++++++++++++++++ -5.000E-03
X
20 XX++++++++++++++++++ -9.537E-09
L
X 0000
21 XX++0000++++++++++++ 5.000E-03
X0 000000000000
0
22 XX+000000000000000000 1.000E-02
X
0
23 XXX000000000000000000 1.500E-02
L
0
24 XXX000000000000000000 2.000E-02
L
000
25 0X000000000000000000 2.500E-02
L
0
26 0000000000000000000 3.000E-02

```
  27 0000000000000000000  3.500E-02
+    L
  28 0000000000000000000  4.000E-02
  29 0000000000000000000  4.500E-02
+    L
  30 0000000000000000000  5.000E-02
  31 0000000000000000000  5.500E-02
+    L
  32 0000000000000000000  6.000E-02
  33 0000000000000000000  6.500E-02
+    L
  34 0000000000000000000  7.000E-02
  35 0000000000000000000  7.500E-02
+    L
  36 0000000000000000000  8.000E-02
  37 0000000000000000000  8.500E-02
+    L
  38 0000000000000000000  9.000E-02
  39 0000000000000000000  9.500E-02
+    L
  40 0000000000000000000  1.000E-01
     12345678901234567890
               1         2
ZBLK/     PROB          1.30000D+00     4114CCCC00000000
     ATMOS          5.00000D+00     4150000000000000
```


BREF	0.0	0000000000000000
CODE	1.00000D+00	4110000000000000
COLD	0.00001D-79	0000000100000000
CYCLE	1.04000D+02	4268000000000000
DIMEN	2.00000D+00	4120000000000000
DT	4.79772D-08	3ACE0F8600000000
ELC	6.24793D+13	4C38D31B00000000
EOS	6.00000D+00	4160000000000000
ETH	6.24796D+13	4C38D32900000000
EXPAND	5.00000D-02	3FCCCCCB00000000
FAIL	0.0	0000000000000000
FLUXER	3.00000D+00	4130000000000000
GEOM	2.00000D+00	4120000000000000
IMAX	2.00000D+01	4214000000000000
IQ	1.90000D+01	4213000000000000
ISLAND	0.0	0000000000000000
JMAX	4.00000D+01	4228000000000000
JQ	3.90000D+01	4227000000000000
HOB	0.0	0000000000000000
LREF	0.00001D-79	0000000100000000
METHOD	2.00000D+00	4120000000000000
MLC	6.43812D+03	4419261F00000000
MTH	6.43813D+03	4419262100000000
NH	2.00000D+01	4214000000000000
NHIC	1.60000D+03	4364000000000000
NHIST	6.00000D+00	4160000000000000

NN	3.00000D+00	4130000000000000
NOP	1.60000D+01	4210000000000000
NPP	3.00000D+00	4130000000000000
NROWPB	4.00000D+00	4140000000000000
NSTN	1.60000D+01	4210000000000000
NVARST	1.60000D+01	4210000000000000
PTSTOP	6.00000D+02	4325800000000000
RADLOS	0.0	0000000000000000
REZONE	0.0	0000000000000000
RREF	0.0	0000000000000000
STABF	5.00000D-01	4080000000000000
STRAIN	1.00000D+00	4110000000000000
STRESS	1.00000D+00	4110000000000000
SUME	0.0	0000000000000000
T	3.46067D-06	3C3A0F7600000000
TERAD	0.0	0000000000000000
TLC	3.46067D-06	3C3A0F7600000000
TREF	0.0	0000000000000000
TTIME	2.16132D+02	42D821B000000000
TTSTOP	1.00000D+02	4264000000000000
UREZ	1.00000D+01	41A0000000000000
VISC	0.0	0000000000000000
VREZ	1.00000D+01	41A0000000000000
VOIDS	0.0	0000000000000000
WORK	0.0	0000000000000000

X1	4.00000D+00	4140000000000000
X2	-1.00000D+00	C110000000000000
XOB	0.0	0000000000000000
Y1	8.00000D+00	4180000000000000
Y2	3.20000D+01	4220000000000000
YGND	0.0	0000000000000000
YIELD	0.0	0000000000000000
AIR	1.00000D+00	4110000000000000
FE	2.00000D+00	4120000000000000
CONCRT	3.00000D+00	4130000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000
	0.0	0000000000000000

```
                    0.0             0000000000000000
                    0.0             0000000000000000
                    0.0             0000000000000000
                    0.0             0000000000000000
                    0.0             0000000000000000
                    0.0             0000000000000000
                    0.0             0000000000000000
                    0.0             0000000000000000
                    0.0             0000000000000000
                    0.0             0000000000000000
                    0.0             0000000000000000
                    0.0             0000000000000000
                    0.0             0000000000000000
                    0.0             0000000000000000
1SUMMARY OF ERRORS FOR THIS JOB   ERROR NUMBER   NUMBER OF ERRORS

0                                 208            437

END OF DATA
```

PROBLEM 1.3 CYBER 176 HULL RUN

```
BATCH       CREATED 08/18/78  TODAY IS 08/21/78
  AUTOMATIC BULLETIN TO BATCH JOBS
+
```

	SYSBULL	CONTENTS
8/18/78	STATUS	AVAILABILITY STATUS OF ALL SYSTEMS
8/ 9/78	MEMMGT	CM AND ECS FIELD MANAGEMENT
7/31/78	NASTRAN	INFORMATION FOR USERS OF NASTRAN
7/18/78	CONTACT	WHO TO CONTACT ABOUT COMPUTER PROBLEMS
7/14/78	MODS	FEATURES ADDED TO CDC NOS/BE
7/14/78	CMECMGT	CM AND ECS FIELD LENGTH MANAGEMENT
6/23/78	FLECS	STRUCTURED PROGRAMMING PRE-PROCESSOR FOR FTN
6/20/78	LETTER	AFWL COMPUTER CENTER NEWSLETTER
6/14/78	ASPLIB	AFWL COMMON MATH LIBRARIES
5/16/78	CLASS	CLASSES FOR USERS OF AFWL COMPUTER CENTER
5/ 8/78	ACCESS	HOW TO OBTAIN AN AFWL/KAFB COMPUTER ACCOUNT
5/ 4/78	CONFIG	SYSTEMS CONFIGURATION
5/ 4/78	EXPDITE	AFWR CUSTOMER SERVICE (EXPEDITOR)
5/ 1/78	PRIORTY	JOB CARD PRIORITY CODES
4/24/78	BILLING	AFWL COMPUTER BILLING INFORMATION
4/21/78	DIALUP	COMPUTER DIALUP PHONE NUMBERS
4/19/78	INTRO	BASIC INTRODUCTION TO KAFB COMPUTER CENTER
4/18/78	DUMPS	STANDARD PROCEDURES FOR ERROR DUMPS
4/14/78	TITLE	MICROFICHE VISUAL TITLE GENERATION
4/11/78	REQUEST	STANDARD PROCEDURES FOR REQUESTING TAPES
4/ 6/78	PLOT	DEVICE INDEPENDENT PLOT SYSTEM -METAPLOT-
3/31/78	ACCOUNT	ACCOUNT CARD FORMAT.
3/30/78	PFRULES	LOCAL RULES FOR CATALOGING FILES
3/30/78	BACKUP	PERMANENT FILE BACKUP PROCEDURES
3/30/78	PRMFILE	PERM FILE ACCOUNTING AND BACKUP SYSTEMS
3/ 9/78	LABEL	AFWL LABELLED TAPE PROCESSING
3/ 9/78	FR80	280 SIMULATION VIA FR80
3/ 9/78	COMPILE	FTN COMPILER CHANGES AND RELEASES
3/ 8/78	AFSCNET	INFORMATION ABOUT AFSCNET
3/ 7/78	METAQUE	AUTOMATIC DISPOSITION OF META PLOT FILES
2/10/78	SWITCH	NEW INTERCOM PHONE SWITCH
1/17/78	DIFFER	DIFFERENCES IN NOS/BE FROM 6600 TO CYBER 176
1/ 4/78	DISSTIP	DISSPLA TECH. INFO. PROGRAMMING SUGGESTIONS
10/ 3/77	DISSPLA	A NEW USER ORIENTED PLOTING PACKAGE

SYSTEM WARNINGS

8/16/78	BUDGETARY CONSIDERATION FOR FY 79: 176 CHARGES WILL GO UP BY ABOUT 15%.
8/16/78	REVIEW, SIGN AND RETURN TAPE INVENTORY LISTINGS BEFORE 21 AUGUST 1978.
8/16/78	+++++ FLASH MESSAGE +++++ CYBER RECORD MANAGER ANALYSIS CLASS HAS BEEN
8/16/78	+++++ CHANGED TO AUG 28-30. ALL CLASS MEMBERS TAKE NOTE +++++ FLASH +++
8/16/78	** NOTICE TO CONTRACTORS ** CONTRACTOR WORK AREA IN ROOM 110 OF BLDG
8/16/78	412 WILL NOT BE AVAILABLE AFTER 28 AUG 78. THIS WILL BE THE NEW
8/16/78	PCAM AREA. PLEASE REMOVE ALL LISTINGS OR CARD DECKS STORED THERE.
8/16/78	

```
NOT ENOUGH RESOURCES.  I COULD ONLY PROVIDE   2
+
TAPE4 SEARCH FOR START CYCLE
```

+
+
STEEL PENETRATOR INTO CONCRETE
+
+
PROB 1.3000 CYCLE 0 TIME 0.
BACKSPACING 2 RECORDS
TAPE POSITIONED
+
DISK VERSION
+
+
+
+
+
***** OPTIONS SELECTED FOR THIS RUN *****
+
DIFFERENCE METHOD -

SHELL II

AND MATERIAL STRENGTH

WITH 6 FLUXED HISTORIES/CELL

STATION DATA ROUTINES INCLUDED
EQUATION OF STATE -

SOLIDS - NO STRENGTH
ATMOSPHERE -

CONSTANT
VOLUME AND ENERGY FLUXING
REZONE -

NO REZONE
CODE -

HULL
DIMENSIONS -

2-D
GEOMETRY -

CYLINDRICAL
NO RADIATION ROUTINES
PARTICLES -

CODE INCLUDED

THE FOLLOWING OPTIONS WERE DEFINED BY PLANK.
+

ATMOS	=	5
BURN	=	0
CODE	=	1
DIMEN	=	2
EOS	=	6
GEOM	=	2
HOT	=	0
IMAX	=	20
ISLAND	=	0
JMAX	=	40
KMAX	=	1
LBUFA	=	1729
LBUFB	=	122
MAGFLD	=	0
METHOD	=	2
NH	=	20
NHIC	=	1600
NM	=	3
NOP	=	16
NHIST	=	6
NPLPB	=	2
NPP	=	2
NROWPB	=	4
NSTN	=	16
NVARST	=	15
RAD	=	0
REZONE	=	0
STRESS	=	1
SURF	=	0
SW	=	6
SWX	=	0
VISC	=	0
LAMB	=	0
BBOUND	=	0
LBOUND	=	0
KEEL	=	0
PULL	=	0
VOIDS	=	0
FLUXER	=	3
DEPOS	=	0
FAIL	=	0
STRAIN	=	1
WORK	=	0
MAT	=	3
AIR	=	1
FE	=	2
CONCRT	=	3

THE FOLLOWING OPTIONS WERE SPECIFIED WHEN EXECUTIVE PROCESSING BEGAN

INST	=	1
PRG	=	0
PLANK	=	0
PULL	=	0
KEEL	=	0
LIBRARY	=	0
ATMOS	=	5
BURN	=	0
CODE	=	1
DIMEN	=	2
EOS	=	6
GEOM	=	2
HOT	=	0
IMAX	=	20
ISLAND	=	0
JMAX	=	40
KMAX	=	1
LBUFA	=	1729
LBUFB	=	122
MAGFLD	=	0
METHOD	=	2
NH	=	20
NHIC	=	1600
NM	=	3
NOP	=	16
NHIST	=	6
NPLPB	=	2
NPP	=	2
NROWPB	=	4
NSTN	=	16
NVARST	=	15
RAD	=	0
REZONE	=	0
STRESS	=	1
SURF	=	0
SW	=	6
SWX	=	0
VISC	=	0
LAMB	=	0
BBOUND	=	0
LBOUND	=	0
VOIDS	=	0
FLUXER	=	3
DEPOS	=	0
FAIL	=	0
STRAIN	=	1
WORK	=	0
MAT	=	3
AIR	=	1
FE	=	2
CONCRT	=	3

+
+

THE FOLLOWING DEFINITIONS OR REDEFINITIONS WERE MADE DURING EXECUTIVE PROCESSING

```
+
+
SYS       =        176
VER       =          4
NOSBE     =          1
PF        =          1
ECS       =          1
OBJLIB    =          1
TAPELIB   =          4
ROUTE     =          1
DENSHUL   =          5
DENSLIB   =          5
DENSSTA   =          3
LABEL     =          1
DATE      =          1
CONTROL   =          1
CDC       =          1
IBM       =          0
CW        =         10
NW        =          1
RDEND     =          2
CARDL     =          8
CARDO     =         80
NHEC      =      16000
NBLKS     =         10
NPIC      =         32
NPICMAX   =       3020
STRAIN    =          1
STRESS    =          1
DEBUG     =          0
FILMPR    =          1
HLEV      =          1
D$NAMEA   =         21
D$NAMEB   =         12
D$NAMEB   =         13
D$NAMEB   =         15
D$NAMEB   =         17
D$NAMEC   =         14
D$NAMEC   =         15
D$NAMEC   =         16
D$NAMEC   =         18
D$NAMED   =          5
AIREOS    =          1
```

```
PLANK START
NOT A 555 RECORD
PROB    1.3000  STARTUP ON CYCLE     0  TIME    0.
+
+
+
+
+
+
```

MATERIAL PROPERTIES DEFINED FOR THIS RUN

MATERIAL	AMBIENT YIELD (Y0)	THERMAL SHOFTENING YLD/Y0	EE/EMELT	WORK HARDENING YIELD	PLASTIC STRAIN
2	4.690E+09	1.00E+02	0.	4.690E+09	0.
		9.00E-01	5.00E-01	5.500E+09	3.00E-01
		9.00E-01	5.00E-01		
		0.	1.00E+00		
3	3.000E+09	1.00E+00	0.	3.000E+09	0.
		-I	-I	-I	-I
		-I	-I		
		0.	1.00E+00		

```
+
+
+
+
+
+
   STEEL PENETRATOR INTO CONCRETE
+
+
+
+
ZBLK
    PROB          1.30000000000000E+00    1720514631463146
    ATMOS         5.00000000000000E+00    1722500000000000000
    BREF          0.                      0000000000000000000
    CODE          1.00000000000000E+00    1720400000000000000
    COLD          0.                      7777777777777777776
    CYCLE         0.                      0000000000000000000
    DIMEN         2.00000000000000E+00    1721400000000000000
    DT            1.00000000000000E-08    1665527461670430214 2
    ELC           0.                      0000000000000000000
    EOS           6.00000000000000E+00    1722600000000000000
    ETH           0.                      0000000000000000000
    EXPAND        5.00000000000000E-02    1713631463146315
    FAIL          0.                      0000000000000000000
    FLUXER        3.00000000000000E+00    1721600000000000000
    GEOM          2.00000000000000E+00    1721400000000000000
    IMAX          2.00000000000000E+01    1724500000000000000
    IQ            1.90000000000000E+01    1724460000000000000
    ISLAND        0.                      0000090000000000000
    JMAX          4.00000000000000E+01    1725500000000000000
```

JQ	3.900000000000000E+01	1725470000000000000
HOB	0.	0000000000000000000
LREF	0.	7777777777777777776
METHOD	2.000000000000000E+00	1721400000040000000
MLC	0.	0000000000000000000
MTH	0.	0000000000000000000
NH	2.000000000000000E+01	1724500000000000000
NHIC	1.600000000000000E+03	1732620000000000000
NHIST	6.000000000000000E+00	1722600000000000000
NM	3.000000000000000E+00	1721600000000000000
NOP	1.600000000000000E+01	1724400000000000000
NPP	2.000000000000000E+00	1721400000000000000
NROWPB	4.000000000000000E+00	1722400000000000000
NSTN	1.600000000000000E+01	1724400300000000000
NVARST	1.500000000000000E+01	1723740000000000000
PTSTOP	6.000000000000000E+02	1731454000000000000
RADLOS	0.	0000000000000000000
REZONE	0.	0000000000000000000
RREF	0.	0000000000000000000
STABF	5.000000000000000E-01	1717400000000000000
STRAIN	1.000000000000000E+00	1720400000000000000
STRESS	1.000000000000000E+00	1720400000000000000
SUME	0.	0000000000000000000
T	0.	0000000000000000000
TERAD	0.	0000000000000000000
TLC	0.	0000000000000000000
TREF	0.	0000000000000000000
TTIME	0.	0000000000000000000
TTIME6	0.	0000000000000000000
TTIME7	0.	0000000000000000000
TTSTOP	1.000000000000000E+02	1726620000000000000
UREZ	1.000000000000000E+01	1723500000000000000
VISC	0.	0000000000000000000
VREZ	1.000000000000000E+01	1723500000000000000
VOIDS	0.	0000000000000000000
WORK	0.	0000000000000000000
X1	4.000000000000000E+00	1722400000000000000
X2	-1.000000000000000E+00	6057377777777777777
XOB	0.	0000000000000000000
Y1	8.000000000000000E+00	1723400000000000000
Y2	3.200000000000000E+01	1725400000000000000
YGND	0.	0000000000000000000
YIELD	0.	0000000000000000000
AIR	1.000000000000000E+00	1720400000000000000
FE	2.000000000000000E+00	1721400000000000000
CONCRT	3.000000000000000E+00	1721600000000000000
STAPE	1.0289487048730O-196	0505364155555555551831
	0.	0000000000000000000
	0.	0000000000000000000
	0.	0000000000000000000
	0.	0000000000000000000
	0.	0000000000000000000
	0.	0000000000000000000
	0.	0000000000000000000

```
                    0.                             00000000000000000000
                    0.                             00000000000000000000
                    0.                             00000000000000000000
                    0.                             00000000000000000000
                    0.                             00000000000000000000
                    0.                             00000000000000000000
                    0.                             00000000000000000000
                    0.                             00000000000000000000
                    0.                             00000000000000000000
                    0.                             00000000000000000000
                    0.                             00000000000000000000
                    0.                             00000000000000000000
                    0.                             00000000000000000000
                    0.                             00000000000000000000
                    0.                             00000000000000000000
                    0.                             00000000000000000000
                    0.                             00000000000000000000
                    0.                             00000000000000000000
                    0.                             00000000000000000000
+
INOPT
    MRELER          1.00000000000000E+01           17235000000000000000
    CSTOP           1.04000000000000E+02           17266400000000000000
    RTSTOP          1.00000000000000E+20           20235327435361326142
    DCYCST          1.00000000000000E+20           20235327435361326142
    PRINTW          0.                             77777777777777777776
    DEBUG           0.                             00000000000000000000
    X1NEW           1.50000000000000E+01           17237400000000000000
    Y1NEW           5.50000000000000E+01           17256700000000000000
    Y2NEW           8.50000000000300E+01           17265240000000000000
    TIMES           3.00000000000000E+00           17216000000000000000
    DMPINT          9.99999999999977E-07           16744143367501327551
    VMIN            1.00000000000000E-03           17064061115645706520
    ITRACE          0.                             00000000000000000000
    JTRACE          0.                             00000000000000000000
+
+
***********
***********
+
PROB    1.3000     CYCLE     0     TIME  0.              DT  1.000000E-08
+
+
+
    INTERNAL ENERGY        KINETIC ENERGY         TOTAL ENERGY              ETH              REL ERROR
  5.12878912881219E+12   5.73511793141665E+13   6.24799634429785E+13   6.24799684429785E+13   0.
+
                                                 TOTAL MASS                MTH              RELMERR
                                              6.43844433782561E+03   6.43844433782561E+03   0.
+
MAX VEL =           -I AT I**** J****
+
MAX CS =            -I AT I**** J****
+
```

MAX TEMP= -I AT I**** J****

+

MAX P = -I AT I**** J****

+

CELL SETTING DT, I**** J****

+

+

TOTAL TIME FOR THIS PROBLEM 0 HOURS, 0 MIN, 0 SEC

OF THIS 0 HOURS, 0 MIN, 0 SEC IS 6600 TIME.

AND 0 HOURS, 0 MIN, 0 SEC IS 7600/176 TIME.

+

TIME FOR THIS RUN 0 HOURS, 0 MIN, 25 SEC

+

I= 1 X(I)= .500 DX(I)= .500

+

J	P	U	V	XI	RHO	SRR	SZZ	SRZ	Y	DY	M	XM	M	XM
+														
1	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	-9.50E+00	5.00E-01	1	4.81056E-04		
2	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	-9.00E+00	5.00E-01	1	4.81056E-04		
3	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	-8.50E+00	5.00E-01	1	4.81056E-04		
4	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	-8.00E+00	5.00E-01	1	4.81056E-04		
5	1.013E+06	0.	7.62E+05	1.268E+09	7.860E+00	0.	0.	0.	-7.50E+00	5.00E-01	2	3.08661E+00		
6	1.013E+06	0.	7.62E+05	1.268E+09	7.860E+00	0.	0.	0.	-7.00E+00	5.00E-01	2	3.08661E+00		
7	1.013E+06	0.	7.62E+05	1.268E+09	7.860E+00	0.	0.	0.	-6.50E+00	5.00E-01	2	3.08661E+00		
8	1.013E+06	0.	7.62E+05	1.268E+09	7.860E+00	0.	0.	0.	-6.00E+00	5.00E-01	2	3.08661E+00		
9	1.013E+06	0.	7.62E+05	1.268E+09	7.860E+00	0.	0.	0.	-5.50E+00	5.00E-01	2	3.08661E+00		
10	1.013E+06	0.	7.62E+05	1.268E+09	7.860E+00	0.	0.	0.	-5.00E+00	5.00E-01	2	3.08661E+00		
11	1.013E+06	0.	7.62E+05	1.268E+09	7.860E+00	0.	0.	0.	-4.50E+00	5.00E-01	2	3.08661E+00		
12	1.013E+06	0.	7.62E+05	1.268E+09	7.860E+00	0.	0.	0.	-4.00E+00	5.00E-01	2	3.08661E+00		
13	1.013E+06	0.	7.62E+05	1.268E+09	7.860E+00	0.	0.	0.	-3.50E+00	5.00E-01	2	3.08661E+00		
14	1.013E+06	0.	7.62E+05	1.268E+09	7.860E+00	0.	0.	0.	-3.00E+00	5.00E-01	2	3.08661E+00		
15	1.013E+06	0.	7.62E+05	1.268E+09	7.860E+00	0.	0.	0.	-2.50E+00	5.00E-01	2	3.08661E+00		
16	1.013E+06	0.	7.62E+05	1.268E+09	7.860E+00	0.	0.	0.	-2.00E+00	5.00E-01	2	3.08661E+00		
17	1.013E+06	0.	7.62E+05	1.268E+09	7.860E+00	0.	0.	0.	-1.50E+00	5.00E-01	2	3.08661E+00		
18	1.013E+06	0.	7.62E+05	1.268E+09	7.860E+00	0.	0.	0.	-1.00E+00	5.00E-01	2	3.08661E+00		
19	1.013E+06	0.	7.62E+05	1.268E+09	7.860E+00	0.	0.	0.	-5.00E-01	5.00E-01	2	3.08661E+00		
20	1.013E+06	0.	7.62E+05	1.268E+09	7.860E+00	0.	0.	0.	0.	5.00E-01	2	3.08661E+00		
21	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	5.00E-01	5.00E-01	3	8.63938E-01		
22	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	1.00E+00	5.00E-01	3	8.63938E-01		
23	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	1.50E+00	5.00E-01	3	8.63938E-01		
24	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	2.00E+00	5.00E-01	3	8.63938E-01		
25	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	2.50E+00	5.00E-01	3	8.63938E-01		
26	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	3.00E+00	5.00E-01	3	8.63938E-01		
27	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	3.50E+00	5.00E-01	3	8.63938E-01		
28	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	4.00E+00	5.00E-01	3	8.63938E-01		
29	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	4.50E+00	5.00E-01	3	8.63938E-01		
30	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	5.00E+00	5.00E-01	3	8.63938E-01		
31	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	5.50E+00	5.00E-01	3	8.63938E-01		
32	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	6.00E+00	5.00E-01	3	8.63938E-01		
33	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	6.50E+00	5.00E-01	3	8.63938E-01		
34	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	7.00E+00	5.00E-01	3	8.63938E-01		
35	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	7.50E+00	5.00E-01	3	8.63938E-01		
36	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	8.00E+00	5.00E-01	3	8.63938E-01		
37	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	8.50E+00	5.00E-01	3	8.63938E-01		

```
38  1.013E+06  0.        0.        7.810E+08 2.200E+00  0.        0.        0.        9.00E+00 5.00E-01 3 8.63930E-01
39  1.013E+06  0.        0.        7.810E+08 2.200E+00  0.        0.        0.        9.50E+00 5.00E-01 3 8.63938E-01
40  1.013E+06  0.        0.        7.810E+08 2.200E+00  0.        0.        0.        1.00E+01 5.00E-01 3 8.63938E-01
+
                                                         MATERIAL MAP
+
+
              1         2

                          ALTITUDE
    12345678901234567890

                           METERS
 1  ++++++++++++++++++++ -9.500E-02
 2  ++++++++++++++++++++ -9.000E-02
 3  ++++++++++++++++++++ -8.500E-02
 4  ++++++++++++++++++++ -8.000E-02

    L
 5  XX++++++++++++++++++ -7.500E-02
 6  XX++++++++++++++++++ -7.000E-02

    L
 7  XX++++++++++++++++++ -6.500E-02
 8  XX++++++++++++++++++ -6.000E-02
 9  XX++++++++++++++++++ -5.500E-02
10  XX++++++++++++++++++ -5.000E-02

    L
11  XX++++++++++++++++++ -4.500E-02
12  XX++++++++++++++++++ -4.000E-02
13  XX++++++++++++++++++ -3.500E-02
14  XX++++++++++++++++++ -3.000E-02

    L
15  XX++++++++++++++++++ -2.500E-02
16  XX++++++++++++++++++ -2.000E-02
17  XX++++++++++++++++++ -1.500E-02
18  XX++++++++++++++++++ -1.000E-02

    L
19  XX++++++++++++++++++ -5.000E-03
20  XX++++++++++++++++++  0.
21  00000000000000000000  5.000E-03

    L
22  00000000000000000000  1.000E-02
23  00000000000000000000  1.500E-02

    L
24  00000000000000000000  2.000E-02
25  00000000000000000000  2.500E-02

    L
```

```
26 0000000000000000000  3.000E-02
27 0000000000000000000  3.500E-02

   L
28 0000000000000000000  4.000E-02
29 0000000000000000000  4.500E-02

   L
30 0000000000000000000  5.000E-02
31 0000000000000000000  5.500E-02

   L
32 0000000000000000000  6.000E-02
33 0000000000000000000  6.500E-02

   L
34 0000000000000000000  7.000E-02
35 0000000000000000000  7.500E-02

   L
36 0000000000000000000  8.000E-02
37 0000000000000000000  8.500E-02

   L
38 0000000000000000000  9.000E-02
39 0000000000000000000  9.500E-02

   L
40 0000000000000000000  1.000E-01
   12345678901234567890
            1         2
  CYCLE      1   TIME 1.0000E-08  DT 4.088E-08   IDT    1  JDT    6
  CYCLE      2   TIME 5.0865E-08  DT 6.114E-08   IDT    2  JDT   20
  CYCLE      3   TIME 1.1203E-07  DT 8.059E-08   IDT    2  JDT   20
  CYCLE      4   TIME 1.9261E-07  DT 9.927E-08   IDT    2  JDT   20
  CYCLE      5   TIME 2.9188E-07  DT 1.174E-07   IDT    2  JDT   20
  CYCLE      6   TIME 4.0931E-07  DT 1.354E-07   IDT    2  JDT   20
  CYCLE      7   TIME 5.4470E-07  DT 1.537E-07   IDT    2  JDT   20
  CYCLE      8   TIME 6.9836E-07  DT 1.659E-07   IDT    2  JDT   20
  CYCLE      9   TIME 8.6426E-07  DT 1.357E-07   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=  5.3377743E+08 XI(N+1)=  -1.7597579E+08 KE(N+1)=   5.1226002E+06
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=  5.3525509E+08 XI(N+1)=  -1.7415078E+08 KE(N+1)=   5.2988794E+06
EG ENERGY AT I=   1 J=   4
)=  8.161234556273231E+04 U=  0.                    V=  2.430273285124427E-01
(I= -1.699561965484762E+08 XM=  1.453806178714498E-04
(M=  1.453806178714507E-04  0.                      0.
EG ENERGY AT I=   2 J=   4
=  8.189924442216521E+04 U= -3.234012309591829E-01 V=  2.415297367428995E-01
(I= -1.667644609785099E+08 XM=  4.366931628822217E-04
(M=  4.366931628622235E-04  0.                      0.
  CYCLE     10   TIME 1.0000E-06  DT 1.386E-07   IDT    2  JDT   21
+
r
**********
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PROB 1.3000 CYCLE 10 TIME 1.000000E-06 DT 1.385674E-07

INTERNAL ENERGY	KINETIC ENERGY	TOTAL ENERGY	ETH	REL ERROR
6.671267925248 12E+12	5.530894637560 05E+13	6.2480214500848 5E+13	6.247996844297 85E+13	3.938188128641 06E+00

TOTAL MASS	MTH	RELMERR
6.438444337825 70E+03	6.438444337825 61E+03	1.356096081428 42E-08

MAX VEL = 7.62006E+05 AT I 2 J 12

MAX CS = 6.64092E+05 AT I 2 J 21

MAX TEMP= 1.81832E+04 AT I 3 J 21

MAX P = 4.98903E+11 AT I 2 J 21

CELL SETTING DT, I 2 J 21

TOTAL TIME FOR THIS PROBLEM 0 HOURS, 0 MIN, 3 SEC
OF THIS 0 HOURS, 0 MIN, 0 SEC IS 6600 TIME.
AND 0 HOURS, 0 MIN, 3 SEC IS 7600/176 TIME.

TIME FOR THIS RUN 0 HOURS, 0 MIN, 29 SEC

WHIZ FACTOR TOTAL PROBLEM = 4.56E-04 SEC/CELL/CYCLE

WHIZ FACTOR SINCE LAST DUMP = 4.72E-04 SEC/CELL/CYCLE

I= 1 X(I)= .500 DX(I)= .500

J	P	U	V	XI	RHO	SRR	SZZ	SRZ	Y	DY	M	XM	M	XM
1	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	-9.50E+00	5.00E-01	1	4.81056E-04		
2	1.013E+06	-6.02E-10	1.08E-01	2.044E+09	1.225E-03	0.	0.	0.	-9.00E+00	5.00E-01	1	4.80938E-04		
3	1.013E+06	-8.69E-10	6.00E+02	2.044E+09	1.225E-03	0.	0.	0.	-8.50E+00	5.00E-01	1	4.81018E-04		
4	1.538E+04	0.	2.43E-01	1.000E+08	3.702E-04	0.	0.	0.	-8.00E+00	5.00E-01	1	1.45381E-04		
5	6.926E+06	2.81E-01	5.48E+05	5.782E+10	5.296E-04	0.	0.	0.	-7.50E+00	5.00E-01	1	2.07972E-04		
6	6.099E+06	4.26E-01	7.62E+05	1.293E+09	3.743E+00	-7.86E+06	1.63E+07	0.	-7.00E+00	5.00E-01	1	1.27729E-04	2	1.46571E+00
7	-2.386E+07	-8.36E-02	7.62E+05	1.279E+09	7.859E+00	-1.07E+07	2.26E+07	2.89E+05	-6.50E+00	5.00E-01	2	3.08630E+00		
8	-1.800E+07	-1.39E-01	7.62E+05	1.271E+09	7.860E+00	-6.76E+06	1.42E+07	9.67E+05	-6.00E+00	5.00E-01	2	3.08651E+00		
9	-2.670E+04	8.12E-02	7.62E+05	1.269E+09	7.860E+00	-2.05E+06	4.03E+06	1.65E+06	-5.50E+00	5.00E-01	2	3.08660E+00		
10	9.444E+06	1.62E-01	7.62E+05	1.268E+09	7.860E+00	-1.50E+05	1.00E+05	2.45E+06	-5.00E+00	5.00E-01	2	3.08663E+00		
11	1.036E+07	8.70E-02	7.62E+05	1.268E+09	7.860E+00	1.83E+05	-4.45E+05	3.26E+06	-4.50E+00	5.00E-01	2	3.08663E+00		
12	5.060E+06	7.12E-03	7.62E+05	1.268E+09	7.860E+00	8.83E+04	-1.65E+05	3.59E+06	-4.00E+00	5.00E-01	2	3.08662E+00		
13	1.207E+06	-1.69E-03	7.62E+05	1.268E+09	7.860E+00	1.35E+04	-1.95E+04	3.63E+06	-3.50E+00	5.00E-01	2	3.08662E+00		
14	1.490E+06	0.	7.62E+05	1.268E+09	7.860E+00	3.10E+04	-5.99E+04	3.63E+06	-3.00E+00	5.00E-01	2	3.08662E+00		

15	2.334E+06	1.24E-02	7.62E+05	1.268E+09	7.860E+00	2.29E+05	-9.40E+04	3.63E+06	-2.50E+00	5.00E-01	2	3.08662E+00
16	7.633E+07	5.65E-03	7.62E+05	1.268E+09	7.960E+00	7.54E+06	-1.49E+07	3.76E+06	-2.00E+00	5.00E-01	2	3.08675E+00
17	1.955E+08	2.32E+00	7.62E+05	1.268E+09	7.961E+00	3.74E+07	-3.02E+07	3.65E+06	-1.50E+00	5.00E-01	2	3.08697E+00
18	5.159E+09	2.09E+00	7.62E+05	1.270E+09	7.884E+00	8.07E+08	-1.59E+09	2.75E+07	-1.00E+00	5.00E-01	2	3.09612E+00
19	1.459E+10	2.82E+02	7.54E+05	1.324E+09	7.924E+00	2.47E+09	-2.89E+09	4.21E+07	-5.00E-01	5.00E-01	2	3.11102E+00
20	1.586E+11	3.33E+02	7.38E+05	3.188E+09	8.414E+00	1.66E+09	-3.03E+09	5.91E+06	0.	5.00E-01	2	3.30405E+00
21	5.364E+11	1.03E+03	6.54E+05	1.077E+10	9.245E+00	1.20E+09	-2.50E+09	-1.45E+06	5.00E-01	5.00E-01	2	3.63059E+00
22	4.810E+11	9.73E+02	4.28E+05	1.272E+11	9.239E+00	1.08E+09	-2.21E+09	0.	1.00E+00	5.00E-01	2	6.36353E-01 3 1.41968E+0
23	5.570E+10	1.76E+02	9.38E+04	4.167E+10	2.822E+00	3.60E+09	-7.05E+09	1.83E+06	1.50E+00	5.00E-01	3	1.10811E+00
24	1.767E+09	1.30E+01	3.46E+03	1.166E+09	2.245E+00	6.34E+08	-1.21E+09	-1.20E+06	2.00E+00	5.00E-01	3	8.81563E-01
25	9.363E+07	8.68E-01	1.38E+02	7.811E+08	2.201E+00	2.14E+07	-3.76E+07	-9.89E+04	2.50E+00	5.00E-01	3	8.64494E-01
26	5.279E+06	2.25E-02	4.55E+00	7.810E+08	2.200E+00	7.71E+05	-1.35E+06	-3.90E+03	3.00E+00	5.00E-01	3	8.63964E-01
27	1.140E+06	1.44E-08	1.59E-01	7.810E+08	2.200E+00	1.89E+04	-3.03E+04	-6.22E+01	3.50E+00	5.00E-01	3	8.63939E-01
28	1.017E+06	0.	2.82E-03	7.810E+08	2.200E+00	4.63E+02	-7.58E+02	-1.55E-05	4.00E+00	5.00E-01	3	8.63938E-01
29	1.013E+06	0.	1.08E-12	7.810E+08	2.200E+00	1.77E-07	-6.58E-06	-5.34E-15	4.50E+00	5.00E-01	3	8.63938E-01
30	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	5.00E+00	5.00E-01	3	8.63938E-01
31	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	5.50E+00	5.00E-01	3	8.63938E-01
32	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	6.00E+00	5.00E-01	3	8.63938E-01
33	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	6.50E+00	5.00E-01	3	8.63938E-01
34	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	7.00E+00	5.00E-01	3	8.63938E-01
35	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	7.50E+00	5.00E-01	3	8.63938E-01
36	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	8.00E+00	5.00E-01	3	8.63938E-01
37	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	8.50E+00	5.00E-01	3	8.63938E-01
38	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	9.00E+00	5.00E-01	3	8.63938E-01
39	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	9.50E+00	5.00E-01	3	8.63938E-01
40	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	1.00E+01	5.00E-01	3	8.63938E-01

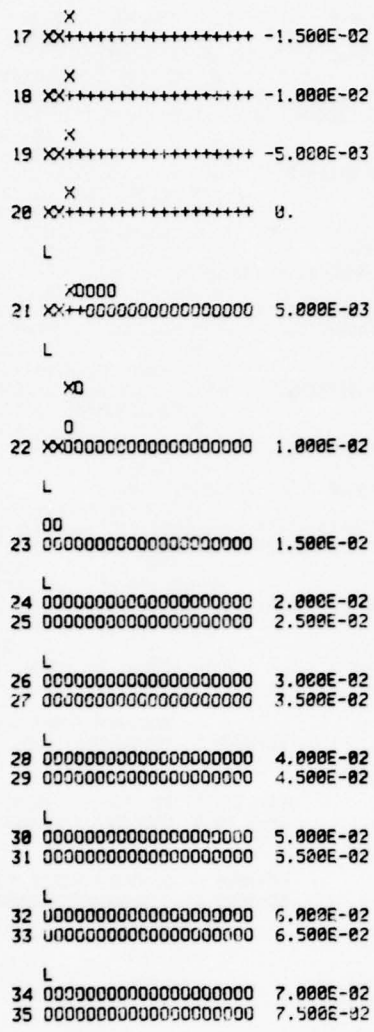
ENERGY MAP

```
          1         2

                              ALTITUDE
   12345678901234567890

                                METERS
 1                          -9.500E-02
 2                          -9.000E-02
 3                          -8.500E-02
 4                          -8.000E-02
 5 BBBBBB                   -7.500E-02
 6 TTTTT                    -7.000E-02

   L
 7    B                     -6.500E-02
 8                          -6.000E-02

   L
 9                          -5.500E-02
10   B                     -5.000E-02
11    T                    -4.500E-02
12    B                    -4.000E-02

   L
```

```
13   TT                  -3.500E-02
14   BB                  -3.000E-02
15  B  B                 -2.500E-02
16 B                     -2.000E-02

   L
17    T                  -1.500E-02
18    B  B               -1.000E-02
19   TTTTT               -5.000E-03
20    BB BB               0.

   L
21   BTT TT               5.000E-03

   L
22   T                    1.000E-02

   L
23 TT                     1.500E-02

   L
24                        2.000E-02
25                        2.500E-02

   L
26                        3.000E-02
27                        3.500E-02

   L
28    B                   4.000E-02
29                        4.500E-02

   L
30 B                      5.000E-02
31                        5.500E-02

   L
32                        6.000E-02
33                        6.500E-02

   L
34                        7.000E-02
35                        7.500E-02

   L
36                        8.000E-02
37                        8.500E-02

   L
38                        9.000E-02
39                        9.500E-02

   L
40  BB BBBBBBBBBBBBBBBB   1.000E-01
```


MATERIAL MAP

```
   12345678901234567890
            1         2
+

+
+
            1         2
                                 ALTITUDE
   12345678901234567890
                                  METERS
 1 ++++++++++++++++++++ -9.500E-02
 2 ++++++++++++++++++++ -9.000E-02
 3 ++++++++++++++++++++ -8.500E-02
 4 ++++++++++++++++++++ -8.000E-02
 5 ++++++++++++++++++++ -7.500E-02
 6 ++++++++++++++++++++ -7.000E-02

   L

   XX
 7 X+++++++++++++++++++ -6.500E-02

    X
 8 X+++++++++++++++++++ -6.000E-02

   L

    X
 9 X+++++++++++++++++++ -5.500E-02

    X
10 X+++++++++++++++++++ -5.000E-02

    X
11 X+++++++++++++++++++ -4.500E-02

    X
12 X+++++++++++++++++++ -4.000E-02

   L

    X
13 XX++++++++++++++++++ -3.500E-02
14 XX++++++++++++++++++ -3.000E-02

     X
15 XX++++++++++++++++++ -2.500E-02

     X
16 XX++++++++++++++++++ -2.000E-02

   L
```


17 -1.500E-02
18 -1.000E-02
19 -5.000E-03
20 0.
21 5.000E-03
22 1.000E-02
23 1.500E-02
24 2.000E-02
25 2.500E-02
26 3.000E-02
27 3.500E-02
28 4.000E-02
29 4.500E-02
30 5.000E-02
31 5.500E-02
32 6.000E-02
33 6.500E-02
34 7.000E-02
35 7.500E-02

```
   L
 36 0000000000000000000  8.000E-02
 37 0000000000000000000  8.500E-02

   L
 38 0000000000000000000  9.000E-02
 39 0000000000000000000  9.500E-02

   L
 40 0000000000000000000  1.000E-01
    12345678901234567890
          1         2
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   1.0000000E+00 XI(N+1)=  -5.8770806E+00 KE(N+1)=   1.9085549E+06
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   1.0000000E+00 XI(N+1)=  -5.8701887E+00 KE(N+1)=   1.9218700E+06
NEG ENERGY AT I=   1 J=   4
P=  1.4126160470849085E+04 U=  0.                      V=  4.582734494789324E-01
XI= -5.8432094282062535E+00 XM=  1.3356187108529066E-04
XM=  1.3356187108529066E-04  0.                        0.
NEG ENERGY AT I=   2 J=   4
P=  1.4147580110750635E+04 U= -6.0933251063676516E-01 V=  4.521212237146379E-01
XI= -5.8147091891857916E+00 XM=  4.0151654379181999E-04
XM=  4.0151654379182176E-04  0.                        0.
   CYCLE    11   TIME 1.1386E-06  DT 1.083E-07   IDT    2  JDT   21
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   1.0000000E+00 XI(N+1)=  -3.9913402E+00 KE(N+1)=   1.2153772E+06
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   1.0000000E+00 XI(N+1)=  -3.9817922E+00 KE(N+1)=   1.2230524E+06
NEG ENERGY AT I=   1 J=   4
P=  1.3291105730447695E+04 U=  0.                      V=  5.389827609870821E-01
XI= -3.9647451780073372E+00 XM=  1.2567686859083346E-04
XM=  1.2567686859883432E-04  0.                        0.
NEG ENERGY AT I=   2 J=   4
P=  1.3322030966197086E+04 U= -7.1590169485870096E-01 V=  5.278234097349497E-01
XI= -3.9360004753084186E+00 XM=  3.7812303789016286E-04
XM=  3.7612383789016456E-04  0.                        0.
   CYCLE    12   TIME 1.2469E-06  DT 8.564E-08   IDT    2  JDT   21
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   1.0000000E+00 XI(N+1)=  -2.6479861E+00 KE(N+1)=   7.5263467E+05
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   1.0000000E+00 XI(N+1)=  -2.6377330E+00 KE(N+1)=   7.5702836E+05
NEG ENERGY AT I=   1 J=   4
P=  1.2707707632035136E+04 U=  0.                      V=  5.677898381505706E-01
XI= -2.6276376560957016E+00 XM=  1.2016374592943546E-04
XM=  1.2016374592943596E-04  0.                        0.
NEG ENERGY AT I=   2 J=   4
P=  1.2747604757835626E+04 U= -7.5340422527583686E-01 V=  5.524284762714409E-01
XI= -2.6003948048814976E+00 XM=  3.6182059463219476E-04
XM=  3.6182059463219826E-04  0.                        0.
   CYCLE    13   TIME 1.3325E-06  DT 6.816E-08   IDT    2  JDT   21
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   1.0000000E+00 XI(N+1)=  -1.6982535E+00 KE(N+1)=   4.6310388E+05
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   1.0000000E+00 XI(N+1)=  -1.6881882E+00 KE(N+1)=   4.6562229E+05
NEG ENERGY AT I=   1 J=   4
P=  1.2286644463904436E+04 U=  0.                      V=  5.573149021873967E-01
XI= -1.6825190613339146E+00 XM=  1.1618280149865636E-04
XM=  1.1618280149865636E-04  0.                        0.
NEG ENERGY AT I=   2 J=   4
P=  1.2334641390009786E+04 U= -7.3891942221227706E-01 V=  5.392832060183466E-01
XI= -1.6577777144241816E+00 XM=  3.5008457166052326E-04
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XM= 3.5008457166085267E-04  0.                          0.
   CYCLE    14   TIME 1.4007E-06  DT 5.436E-08   IDT    2  JDT   21
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=  1.0000000E+08 XI(N+1)=  -1.0556148E+08 KE(N+1)=   2.9120464E+05
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=  1.0000000E+08 XI(N+1)=  -1.0462339E+08 KE(N+1)=   2.9263735E+05
NEG ENERGY AT I=   1 J=   4
P=  1.1973668902861895+04 U=  0.                        V=  5.199972313783192E-01
XI= -1.0432502703088005+08 XM=  1.132203642355716E-04
XM=  1.132203642355721E-04  0.                          0.
NEG ENERGY AT I=   2 J=   4
P=  1.2028754521268085+04 U= -6.887816757908602E-01 V=  5.009134670572060E-01
XI= -1.0213993369289545+08 XM=  3.413741592127404E-04
XM=  3.413741592127439E-04  0.                          0.
   CYCLE    15   TIME 1.4550E-06  DT 4.336E-08   IDT    2  JDT   21
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=  1.0000000E+08 XI(N+1)=  -5.7833218E+07 KE(N+1)=   1.8279634E+05
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=  1.0000000E+08 XI(N+1)=  -5.6993740E+07 KE(N+1)=   1.8361146E+05
NEG ENERGY AT I=   1 J=   4
P=  1.1737384169613365+04 U=  0.                        V=  4.674210547312914E-01
XI= -5.6857929659760955+07 XM=  1.109821710458731E-04
XM=  1.109821710458731E-04  0.                          0.
NEG ENERGY AT I=   2 J=   4
P=  1.1798537716942905+04 U= -6.187004703495020E-01 V=  4.486184985387034E-01
XI= -5.4974547350546365+07 XM=  3.348084216226923E-04
XM=  3.348084216226958E-04  0.                          0.
   CYCLE    16   TIME 1.4984E-06  DT 3.458E-08   IDT    2  JDT   21
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=  1.0000000E+08 XI(N+1)=  -2.1970454E+07 KE(N+1)=   1.1468983E+05
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=  1.0000000E+08 XI(N+1)=  -2.1240756E+07 KE(N+1)=   1.1515508E+05
NEG ENERGY AT I=   1 J=   4
P=  1.1556969796810075+04 U=  0.                        V=  4.085902388190590E-01
XI= -2.1199084610712775+07 XM=  1.092721223579477E-04
XM=  1.092721223579477E-04  0.                          0.
NEG ENERGY AT I=   2 J=   4
P=  1.1623230852373765+04 U= -5.485040068288542E-01 V=  3.909921246941899E-01
XI= -1.9605400061433915+07 XM=  3.298019377478423E-04
XM=  3.298019377478440E-04  0.                          0.
   CYCLE    17   TIME 1.5330E-06  DT 2.756E-08   IDT    2  JDT   21
   CYCLE    18   TIME 1.5605E-06  DT 3.038E-08   IDT    2  JDT   21
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=  5.7450067E+06 XI(N+1)=  -9.6371879E+07 KE(N+1)=   3.1705092E+05
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=  7.0792939E+06 XI(N+1)=  -9.4326325E+07 KE(N+1)=   3.1807748E+05
NEG ENERGY AT I=   1 J=   4
P=  6.4822909196550245+02 U=  0.                        V=  4.161344269105349E-01
XI= -9.5401420864373265+07 XM=  1.065454293070721E-04
XM=  1.065454293070725E-04  0.                          0.
NEG ENERGY AT I=   2 J=   4
P=  8.0402060621527935+02 U= -5.498941300592186E-01 V=  3.962248347179411E-01
XI= -9.2498082303788665+07 XM=  3.218394687492868E-04
XM=  3.218394687492902E-04  0.                          0.
   CYCLE    19   TIME 1.5909E-06  DT 2.420E-08   IDT    2  JDT   21
   CYCLE    20   TIME 1.6151E-06  DT 2.668E-08   IDT    2  JDT   21
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=  2.0847865E+07 XI(N+1)=  -6.5161726E+07 KE(N+1)=   2.3892760E+05
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=  2.2125860E+07 XI(N+1)=  -6.3195676E+07 KE(N+1)=   2.3954884E+05
NEG ENERGY AT I=   1 J=   4
P=  2.3019968838589995+03 U=  0.                        V=  4.134428887778530E-01
XI= -6.4813600082516026E+07 XM=  1.042861911189270E-04
XM=  1.042861911189270E-04  0.                          0.
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NEG ENERGY AT I=   2 J=   4
P=  2.4511218279899 48E+03 U= -5.457860982114511E-01 V=  3.919186788394722E-01
XI= -6.154947169032574E+07 XM=  3.152641149924921E-04
XM=  3.152641149924956E-04  0.                        0.
   CYCLE    21   TIME 1.6418E-06  DT 2.125E-08   IDT    2  JDT   21
   CYCLE    22   TIME 1.6631E-06  DT 2.342E-08   IDT    2  JDT   21
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   3.3260580E+07 XI(N+1)=  -3.9460181E+07 KE(N+1)=   1.7999117E+05
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   3.4466354E+07 XI(N+1)=  -3.7600443E+07 KE(N+1)=   1.8034904E+05
NEG ENERGY AT I=   1 J=   4
P=  3.605617347941443E+03 U=  0.                      V=  4.026708026385553E-01
XI= -3.871771529191041E+07 XM=  1.824006852465725E-04
XM=  1.824006852465725E-04  0.                        0.
   CYCLE    23   TIME 1.6865E-06  DT 1.664E-08   IDT    2  JDT   21
   CYCLE    24   TIME 1.7051E-06  DT 2.054E-08   IDT    2  JDT   21
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   4.3513713E+07 XI(N+1)=  -1.8190397E+07 KE(N+1)=   1.3562037E+05
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   4.4637479E+07 XI(N+1)=  -1.6453774E+07 KE(N+1)=   1.3581144E+05
   CYCLE    25   TIME 1.7257E-06  DT 1.635E-08   IDT    2  JDT   21
   CYCLE    26   TIME 1.7420E-06  DT 1.759E-08   IDT    2  JDT   22
   CYCLE    27   TIME 1.7596E-06  DT 1.937E-08   IDT    2  JDT   22
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   1.1514572E+06 XI(N+1)=  -5.4479534E+07 KE(N+1)=   2.4517698E+05
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   3.3428906E+06 XI(N+1)=  -5.1665792E+07 KE(N+1)=   2.4528554E+05
   CYCLE    28   TIME 1.7790E-06  DT 1.541E-08   IDT    2  JDT   22
   CYCLE    29   TIME 1.7944E-06  DT 1.697E-08   IDT    2  JDT   22
   CYCLE    30   TIME 1.8113E-06  DT 1.870E-08   IDT    2  JDT   22
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   9.7345146E+06 XI(N+1)=  -4.1753411E+07 KE(N+1)=   2.1875343E+05
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   1.1972200E+07 XI(N+1)=  -3.8870410E+07 KE(N+1)=   2.1865916E+05
   CYCLE    31   TIME 1.8300E-06  DT 1.488E-08   IDT    2  JDT   22
   CYCLE    32   TIME 1.8449E-06  DT 1.640E-08   IDT    2  JDT   22
   CYCLE    33   TIME 1.8613E-06  DT 1.806E-08   IDT    2  JDT   22
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   1.6472716E+07 XI(N+1)=  -3.1267599E+07 KE(N+1)=   1.9824967E+05
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   1.8772165E+07 XI(N+1)=  -2.8302975E+07 KE(N+1)=   1.9798362E+05
   CYCLE    34   TIME 1.8794E-06  DT 1.438E-08   IDT    2  JDT   22
   CYCLE    35   TIME 1.8938E-06  DT 1.585E-08   IDT    2  JDT   22
   CYCLE    36   TIME 1.9095E-06  DT 1.746E-08   IDT    2  JDT   22
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   2.2577718E+07 XI(N+1)=  -2.1759897E+07 KE(N+1)=   1.7986074E+05
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   2.4938343E+07 XI(N+1)=  -1.8725254E+07 KE(N+1)=   1.7944912E+05
   CYCLE    37   TIME 1.9271E-06  DT 1.390E-08   IDT    2  JDT   22
   CYCLE    38   TIME 1.9410E-06  DT 1.532E-08   IDT    2  JDT   22
   CYCLE    39   TIME 1.9563E-06  DT 1.688E-08   IDT    2  JDT   22
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   2.8129091E+07 XI(N+1)=  -1.3108360E+07 KE(N+1)=   1.6331409E+05
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   3.0526239E+07 XI(N+1)=  -1.0015774E+07 KE(N+1)=   1.6278141E+05
   CYCLE    40   TIME 1.9732E-06  DT 1.475E-08   IDT    2  JDT   22
   CYCLE    41   TIME 1.9879E-06  DT 1.207E-08   IDT    2  JDT   22
   CYCLE    42   TIME 2.0000E-06  DT 1.633E-08   IDT    2  JDT   22
+
+
**********
**********
+
PROD    1.3000     CYCLE    42     TIME  2.000000E-06     DT  1.633103E-08
+
+
+
     INTERNAL ENERGY          KINETIC ENERGY          TOTAL ENERGY                ETH                  REL ERROR
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```
   8.19923365984778E+12    5.42832675569817E+13    6.24825012168295E+13    6.24799684429785E+13    3.65990417809626E+01
+
                                                      TOTAL MASS                  MTH                    RELMERR
                                                   6.43844433782540E+03    6.43844433782576E+03    8.58860851571307E-08
+
MAX VEL =  7.62004E+05 AT I   2 J  14
+
MAX CS =   7.17223E+05 AT I   1 J  23
+
MAX TEMP=  1.82646E+04 AT I   4 J  21
+
MAX P =   7.23750E+11 AT I   2 J  23
+
CELL SETTING DT, I   2 J  22
+
+
TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN, 15 SEC
                  OF THIS       0 HOURS,  0 MIN,  0 SEC IS 6600 TIME.
                     AND        0 HOURS,  0 MIN, 15 SEC IS 7600/176 TIME.
+
TIME FOR THIS RUN     0 HOURS,  0 MIN, 41 SEC
+
WHIZ FACTOR TOTAL PROBLEM   = 4.65E-04 SEC/CELL/CYCLE
+
WHIZ FACTOR SINCE LAST DUMP = 4.69E-04 SEC/CELL/CYCLE
+
+
+
+
I=   1  X(I)=      .500   DX(I)=      .500
+
 J       P        U         V         XI        RHO       SRR       SZZ       SRZ        Y        DY     M      XM      M      XM
+
  1  1.013E+06  0.        0.       2.044E+09 1.225E-03  0.        0.        0.       -9.50E+00 5.00E-01 1 4.81056E-04
  2  1.011E+06 -1.84E-08  7.82E-01 2.043E+09 1.223E-03  0.        0.        0.       -9.00E+00 5.00E-01 1 4.80321E-04
  3  1.012E+06 -9.26E-09  1.92E+03 2.043E+09 1.224E-03  0.        0.        0.       -8.50E+00 5.00E-01 1 4.80645E-04
  4  3.536E+03 -2.00E-02 -3.28E+02 3.656E+07 2.326E-04  0.        0.        0.       -8.00E+00 5.00E-01 1 9.13333E-05
  5  3.153E+06  7.84E+00  3.47E+05 6.430E+10 2.306E-04  0.        0.        0.       -7.50E+00 5.00E-01 1 9.05721E-05
  6  4.566E+06  1.94E+00  5.95E+05 6.700E+10 3.199E-04  0.        0.        0.       -7.00E+00 5.00E-01 1 1.25636E-04
  7  5.494E+06  2.85E+00  7.54E+05 5.851E+10 4.202E-04  0.        0.        0.       -6.50E+00 5.00E-01 1 1.65011E-04
  8  5.512E+06  2.09E+00  7.62E+05 1.281E+09 7.484E+00 -1.58E+07  3.36E+07  0.       -6.00E+00 5.00E-01 1 7.94547E-06 2 2.93902E+00
  9 -2.754E+07  1.10E+00  7.62E+05 1.276E+09 7.859E+00 -1.53E+07  3.23E+07  1.93E+06 -5.50E+00 5.00E-01 2 3.09637E+00
 10 -1.731E+07  9.82E-01  7.62E+05 1.272E+09 7.860E+00 -1.04E+07  2.15E+07  5.04E+06 -5.00E+00 5.00E-01 2 3.08649E+00
 11  1.529E+06  1.50E+00  7.62E+05 1.269E+09 7.860E+00 -4.91E+06  9.75E+06  7.63E+06 -4.50E+00 5.00E-01 2 3.08658E+00
 12  1.838E+07  2.09E+00  7.62E+05 1.269E+09 7.860E+00 -9.15E+05  1.34E+06  1.03E+07 -4.00E+00 5.00E-01 2 3.08664E+00
 13  2.937E+07  2.36E+00  7.62E+05 1.268E+09 7.860E+00  1.41E+06 -3.34E+06  1.30E+07 -3.50E+00 5.00E-01 2 3.08666E+00
 14  4.303E+07  2.19E+00  7.62E+05 1.268E+09 7.860E+00  4.82E+06 -9.99E+06  1.79E+07 -3.00E+00 5.00E-01 2 3.08669E+00
 15  8.771E+07  2.00E+00  7.62E+05 1.268E+09 7.860E+00  1.47E+07 -2.85E+07  2.15E+07 -2.50E+00 5.00E-01 2 3.08677E+00
 16  4.764E+08  1.39E+00  7.62E+05 1.268E+09 7.862E+00  1.14E+08 -2.24E+08  3.04E+07 -2.00E+00 5.00E-01 2 3.08749E+00
 17  1.657E+09  1.45E+01  7.61E+05 1.269E+09 7.868E+00  4.44E+08 -8.41E+08  2.98E+07 -1.50E+00 5.00E-01 2 3.08966E+00
 18  8.987E+09  1.14E+01  7.59E+05 1.281E+09 7.901E+00  1.60E+09 -3.13E+09  3.19E+07 -1.00E+00 5.00E-01 2 3.10277E+00
 19  3.674E+10  6.08E+01  7.51E+05 1.450E+09 8.016E+00  1.58E+09 -3.12E+09 -1.25E+07 -5.00E-01 5.00E-01 2 3.14801E+00
 20  1.176E+11  1.70E+02  7.26E+05 2.925E+09 8.270E+00  1.53E+09 -3.04E+09  2.21E+06  0.       5.00E-01 2 3.24770E+00
 21  2.824E+11  1.22E+03  6.75E+05 7.564E+09 8.633E+00  1.43E+09 -2.85E+09  1.45E+07  5.00E-01 5.00E-01 2 3.39017E+00
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22	4.910E+11	2.30E+03	6.14E+05	1.042E+10	9.149E+00	1.27E+09	-2.53E+09	-2.05E+07	1.00E+00	5.00E-01	2 3.59277E+00
23	6.833E+11	8.51E+02	5.20E+05	1.157E+11	5.893E+00	1.34E+09	-2.70E+09	0.	1.50E+00	5.00E-01	2 8.77848E-01 3 1.43646E+00
24	2.308E+11	-1.25E+02	2.76E+05	1.064E+11	3.757E+00	3.54E+09	-7.05E+09	4.77E+07	2.00E+00	5.00E-01	3 1.47534E+00
25	1.632E+10	3.66E+01	5.24E+04	1.604E+10	2.561E+00	3.56E+09	-7.05E+09	1.76E+07	2.50E+00	5.00E-01	3 1.00562E+00
26	1.140E+09	4.92E+00	2.64E+03	9.147E+08	2.227E+00	4.61E+08	-9.13E+08	-1.17E+06	3.00E+00	5.00E-01	3 8.74665E-01
27	7.575E+07	5.91E-01	1.88E+02	7.811E+08	2.201E+00	3.44E+07	-6.80E+07	-1.60E+05	3.50E+00	5.00E-01	3 8.64387E-01
28	6.032E+06	2.66E-02	1.06E+01	7.810E+08	2.200E+00	2.28E+06	-4.51E+06	-1.29E+04	4.00E+00	5.00E-01	3 8.63969E-01
29	1.273E+06	3.67E-09	6.40E-01	7.810E+08	2.200E+00	1.16E+05	-2.30E+05	-2.90E+02	4.50E+00	5.00E-01	3 8.63940E-01
30	1.027E+06	0.	2.31E-02	7.810E+08	2.200E+00	6.89E+03	-1.21E+04	6.92E-01	5.00E+00	5.00E-01	3 8.63938E-01
31	1.013E+06	0.	6.43E-12	7.810E+08	2.200E+00	1.12E+02	-2.24E+02	9.66E-10	5.50E+00	5.00E-01	3 8.63938E-01
32	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	-6.83E-08	0.	6.00E+00	5.00E-01	3 8.63938E-01
33	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	6.50E+00	5.00E-01	3 8.63938E-01
34	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	7.00E+00	5.00E-01	3 8.63938E-01
35	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	7.50E+00	5.00E-01	3 8.63938E-01
36	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	8.00E+00	5.00E-01	3 8.63938E-01
37	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	8.50E+00	5.00E-01	3 8.63938E-01
38	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	9.00E+00	5.00E-01	3 8.63938E-01
39	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	9.50E+00	5.00E-01	3 8.63938E-01
40	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	1.00E+01	5.00E-01	3 8.63938E-01

+

ENERGY MAP

+

+

```
          1         2
242                    ALTITUDE
   12345678901234567890

                        METERS
 1                   -9.500E-02
 2                   -9.000E-02
 3   BB              -8.500E-02
 4   TT              -8.000E-02
 5 BBBBBB            -7.500E-02
 6   TTTT            -7.000E-02
 7 TT                -6.500E-02

   L
 8                   -6.000E-02
 9    B              -5.500E-02
10                   -5.000E-02

   L
11                   -4.500E-02
12   B               -4.000E-02
13   TT              -3.500E-02
14   BBB             -3.000E-02

   L
15   TT              -2.500E-02
16 BBBB BB           -2.000E-02
17                   -1.500E-02
18   T    B          -1.000E-02
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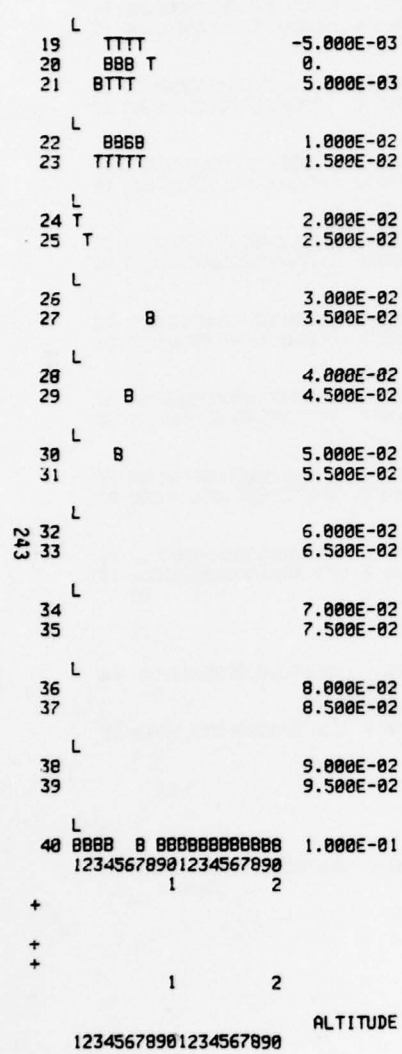
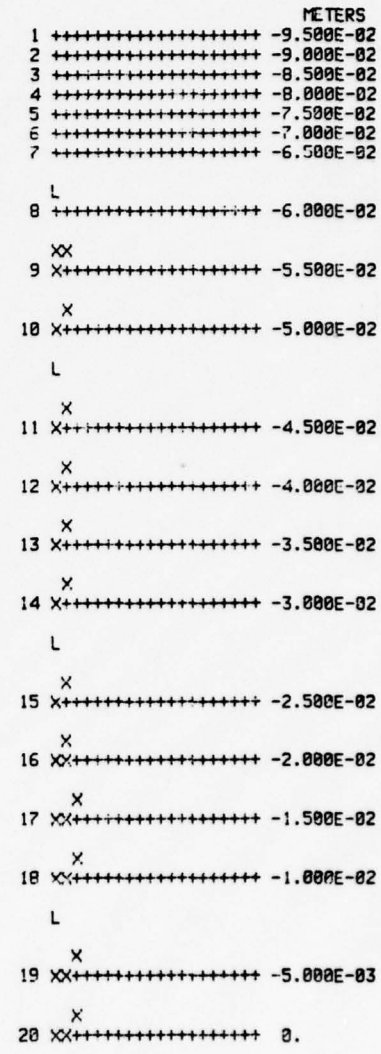
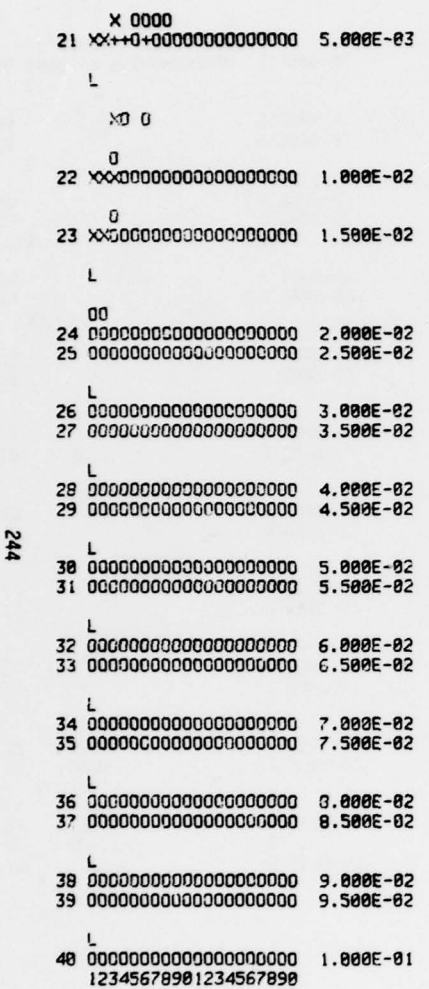


MATERIAL MAP

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1 2

**HYDRO - NEGATIVE ENERGY IN I 1 J 4 XI(N)= 3.6562996E+07 XI(N+1)= -1.8935371E+06 KE(N+1)= 1.3903090E+05
CYCLE 43 TIME 2.0163E-06 DT 1.530E-08 IDT 2 JDT 22
**HYDRO - NEGATIVE ENERGY IN I 2 J 4 XI(N)= 2.4126409E+06 XI(N+1)= -3.2423277E+07 KE(N+1)= 2.5267995E+05

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   CYCLE    44   TIME 2.0316E-06  DT 1.433E-08   IDT    2  JDT   22
   CYCLE    45   TIME 2.0460E-06  DT 1.580E-08   IDT    2  JDT   22
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   3.2573259E+07 XI(N+1)=  -3.2093076E+06 KE(N+1)=   1.4967099E+05
   CYCLE    46   TIME 2.0618E-06  DT 1.480E-08   IDT    2  JDT   22
   CYCLE    47   TIME 2.0766E-06  DT 1.631E-08   IDT    2  JDT   22
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   3.9577668E+06 XI(N+1)=  -3.1273059E+07 KE(N+1)=   2.6641013E+05
   CYCLE    48   TIME 2.0929E-06  DT 1.528E-08   IDT    2  JDT   22
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   3.1979270E+07 XI(N+1)=  -1.2962000E+06 KE(N+1)=   1.5146509E+05
   CYCLE    49   TIME 2.1081E-06  DT 1.432E-08   IDT    2  JDT   22
   CYCLE    50   TIME 2.1225E-06  DT 1.579E-08   IDT    2  JDT   22
   CYCLE    51   TIME 2.1383E-06  DT 1.740E-08   IDT    2  JDT   22
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   8.5291295E+06 XI(N+1)=  -2.7046403E+07 KE(N+1)=   2.6824973E+05
   CYCLE    52   TIME 2.1557E-06  DT 1.630E-08   IDT    2  JDT   22
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   1.0154393E+06 XI(N+1)=  -3.2622521E+07 KE(N+1)=   2.7629215E+05
   CYCLE    53   TIME 2.1720E-06  DT 1.528E-08   IDT    2  JDT   22
   CYCLE    54   TIME 2.1872E-06  DT 1.684E-08   IDT    1  JDT   21
   CYCLE    55   TIME 2.2041E-06  DT 1.853E-08   IDT    1  JDT   21
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   3.6303588E+07 XI(N+1)=  -4.0570853E+05 KE(N+1)=   1.6731092E+05
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   8.3260417E+06 XI(N+1)=  -2.7400917E+07 KE(N+1)=   2.9123721E+05
   CYCLE    56   TIME 2.2226E-06  DT 1.734E-08   IDT    1  JDT   21
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   5.6846769E+05 XI(N+1)=  -3.3172447E+07 KE(N+1)=   1.9207644E+04
   CYCLE    57   TIME 2.2399E-06  DT 1.622E-08   IDT    1  JDT   21
   CYCLE    58   TIME 2.2562E-06  DT 1.785E-08   IDT    1  JDT   21
   CYCLE    59   TIME 2.2740E-06  DT 1.965E-08   IDT    1  JDT   21
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   3.6427880E+07 XI(N+1)=  -2.4026390E+05 KE(N+1)=   1.7926409E+05
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   9.0157770E+06 XI(N+1)=  -2.6555805E+07 KE(N+1)=   3.1190538E+05
   CYCLE    60   TIME 2.2937E-06  DT 1.838E-08   IDT    1  JDT   21
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   8.5278655E+05 XI(N+1)=  -3.2815085E+07 KE(N+1)=   2.0524337E+04
   CYCLE    61   TIME 2.3120E-06  DT 1.719E-08   IDT    1  JDT   21
   CYCLE    62   TIME 2.3292E-06  DT 1.892E-06   IDT    1  JDT   21
   CYCLE    63   TIME 2.3482E-06  DT 2.082E-08   IDT    1  JDT   21
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   1.0305443E+07 XI(N+1)=  -2.4963502E+07 KE(N+1)=   3.3187448E+05
   CYCLE    64   TIME 2.3690E-06  DT 1.948E-08   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   1.3535291E+06 XI(N+1)=  -3.2169201E+07 KE(N+1)=   3.4196408E+05
   CYCLE    65   TIME 2.3885E-06  DT 1.822E-08   IDT    2  JDT   20
   CYCLE    66   TIME 2.4067E-06  DT 2.004E-08   IDT    2  JDT   20
   CYCLE    67   TIME 2.4267E-06  DT 2.205E-08   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   1.2112239E+07 XI(N+1)=  -2.2675977E+07 KE(N+1)=   3.5114530E+05
   CYCLE    68   TIME 2.4488E-06  DT 2.062E-08   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   2.5564541E+06 XI(N+1)=  -3.0610168E+07 KE(N+1)=   3.6227881E+05
   CYCLE    69   TIME 2.4694E-06  DT 1.929E-08   IDT    2  JDT   20
   CYCLE    70   TIME 2.4887E-06  DT 2.122E-08   IDT    2  JDT   20
   CYCLE    71   TIME 2.5099E-06  DT 2.335E-08   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   1.4472328E+07 XI(N+1)=  -1.9687096E+07 KE(N+1)=   3.6938285E+05
   CYCLE    72   TIME 2.5333E-06  DT 2.184E-08   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   4.2154489E+06 XI(N+1)=  -2.8478943E+07 KE(N+1)=   3.8194620E+05
   CYCLE    73   TIME 2.5551E-06  DT 2.042E-08   IDT    2  JDT   20
   CYCLE    74   TIME 2.5755E-06  DT 2.247E-08   IDT    2  JDT   20
   CYCLE    75   TIME 2.5980E-06  DT 2.473E-08   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   1.7315572E+07 XI(N+1)=  -1.6876880E+07 KE(N+1)=   3.8678484E+05
   CYCLE    76   TIME 2.6227E-06  DT 2.313E-08   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   6.2807849E+06 XI(N+1)=  -2.5825039E+07 KE(N+1)=   4.0098503E+05
   CYCLE    77   TIME 2.6458E-06  DT 2.163E-08   IDT    2  JDT   20
   CYCLE    78   TIME 2.6675E-06  DT 2.380E-08   IDT    2  JDT   20
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   CYCLE    79   TIME 2.6913E-06  DT 2.619E-08   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=  2.0651329E+07 XI(N+1)=  -1.1837909E+07 KE(N+1)=   4.0303783E+05
   CYCLE    80   TIME 2.7175E-06  DT 2.449E-08   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=  8.7556226E+06 XI(N+1)=  -2.2650822E+07 KE(N+1)=   4.1909913E+05
   CYCLE    81   TIME 2.7420E-06  DT 2.291E-08   IDT    2  JDT   20
   CYCLE    82   TIME 2.7649E-06  DT 2.521E-08   IDT    2  JDT   20
   CYCLE    83   TIME 2.7901E-06  DT 2.774E-08   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=  2.4485710E+07 XI(N+1)=  -6.9675372E+06 KE(N+1)=   4.1779990E+05
   CYCLE    84   TIME 2.8178E-06  DT 2.595E-08   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=  1.1640527E+07 XI(N+1)=  -1.8954031E+07 KE(N+1)=   4.3595736E+05
   CYCLE    85   TIME 2.8438E-06  DT 2.427E-08   IDT    2  JDT   20
   CYCLE    86   TIME 2.8680E-06  DT 2.670E-08   IDT    2  JDT   20
   CYCLE    87   TIME 2.8947E-06  DT 2.938E-08   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=  2.8821031E+07 XI(N+1)=  -1.4686553E+06 KE(N+1)=   4.3070464E+05
   CYCLE    88   TIME 2.9241E-06  DT 3.234E-08   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=  1.4933308E+07 XI(N+1)=  -1.9972869E+07 KE(N+1)=   4.9272121E+05
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=  3.8233595E+06 XI(N+1)=  -2.8531301E+07 KE(N+1)=   3.8161732E+04
   CYCLE    89   TIME 2.9564E-06  DT 2.395E-08   IDT    2  JDT   20
   CYCLE    90   TIME 2.9804E-06  DT 1.960E-08   IDT    2  JDT   20
   CYCLE    91   TIME 3.0000E-06  DT 3.113E-08   IDT    2  JDT   20
+
+
**********
**********
+
PROB    1.3000     CYCLE    91     TIME  3.000000E-06     DT  3.113082E-08
+
+
+
    INTERNAL ENERGY          KINETIC ENERGY          TOTAL ENERGY              ETH                REL ERROR
 9.64338479846287E+12    5.28417032065052E+13    6.24850880049680E+13    6.24799684429822E+13    4.14002014063608E+01
+
                                                      TOTAL MASS                MTH                RELMERR
                                                 6.43844433782960E+03    6.43844433782832E+03    9.94470459713665E-08
+
MAX VEL =  7.61996E+05 AT I   2 J  13
+
MAX CS =   6.52919E+05 AT I   2 J  25
+
MAX TEMP=   1.86108E+04 AT I   4 J  21
+
MAX P =   4.23700E+11 AT I   2 J  24
+
CELL SETTING DT, I   2 J  20
+
+
TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN, 34 SEC
                  OF THIS       0 HOURS,  0 MIN,  0 SEC IS 6600 TIME.
                      AND       0 HOURS,  0 MIN, 34 SEC IS 7500/176 TIME.
+
TIME FOR THIS RUN     0 HOURS,  1 MIN,  0 SEC
+
WHIZ FACTOR TOTAL PROBLEM   = 4.75E-04 SEC/CELL/CYCLE
+
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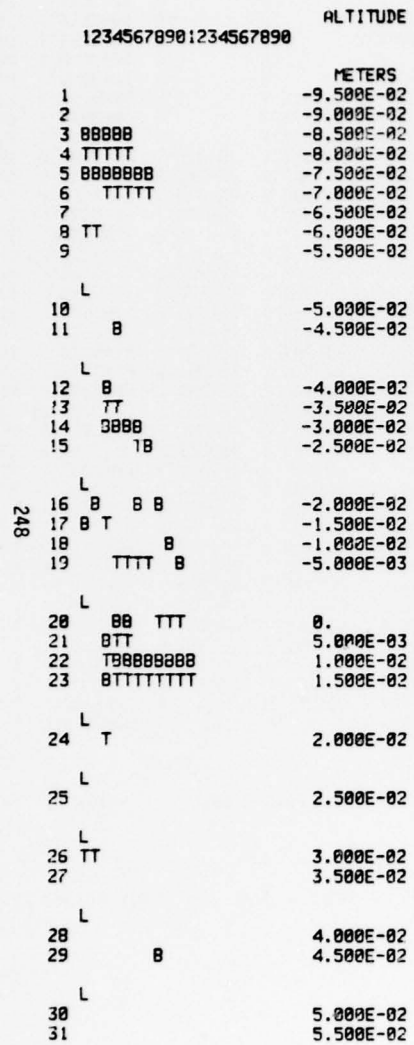
WHIZ FACTOR SINCE LAST DUMP = 4.93E-04 SEC/CELL/CYCLE

I= 1 X(I)= .500 DX(I)= .500

J	P	U	V	XI	RHO	SRR	SZZ	SRZ	Y	DY	M	XM	M	XM
1	1.013E+06	0.	0.	2.044E+09	1.225E-03	0.	0.	0.	-9.50E+00	5.00E-01	1	4.81056E-04		
2	1.007E+06	-6.04E-07	3.11E+00	2.041E+09	1.220E-03	0.	0.	0.	-9.00E+00	5.00E-01	1	4.79060E-04		
3	1.009E+06	-3.38E-07	3.32E+03	2.041E+09	1.222E-03	0.	0.	0.	-8.50E+00	5.00E-01	1	4.79779E-04		
4	4.399E+03	-1.19E-01	-3.67E+02	5.784E+07	1.830E-04	0.	0.	0.	-8.00E+00	5.00E-01	1	7.18538E-05		
5	1.593E+06	4.54E+01	2.39E+05	5.286E+10	1.353E-04	0.	0.	0.	-7.50E+00	5.00E-01	1	5.31379E-05		
6	2.542E+06	5.79E+00	4.44E+05	7.066E+10	1.741E-04	0.	0.	0.	-7.00E+00	5.00E-01	1	6.83539E-05		
7	3.471E+06	-1.38E+01	6.03E+05	7.085E+10	2.347E-04	0.	0.	0.	-6.50E+00	5.00E-01	1	9.21764E-05		
8	4.311E+06	-6.02E+00	7.16E+05	6.657E+10	3.041E-04	0.	0.	0.	-6.00E+00	5.00E-01	1	1.19434E-04		
9	4.628E+06	6.04E+00	7.62E+05	1.293E+09	3.366E+00	-1.68E+07	3.55E+07	0.	-5.50E+00	5.00E-01	1	7.47136E-05	2	1.32193E+00
10	-1.374E+07	4.89E+00	7.62E+05	1.277E+09	7.859E+00	-1.65E+07	3.50E+07	1.16E+06	-5.00E+00	5.00E-01	2	3.08637E+00		
11	-1.992E+07	3.90E+00	7.62E+05	1.274E+09	7.860E+00	-1.45E+07	3.05E+07	6.48E+06	-4.50E+00	5.00E-01	2	3.08643E+00		
12	-1.219E+07	3.76E+00	7.62E+05	1.271E+09	7.860E+00	-9.88E+06	2.04E+07	1.24E+07	-4.00E+00	5.00E-01	2	3.08651E+00		
13	7.537E+06	4.47E+00	7.62E+05	1.270E+09	7.860E+00	-2.71E+06	5.34E+06	1.80E+07	-3.50E+00	5.00E-01	2	3.08659E+00		
14	6.608E+07	5.88E+00	7.62E+05	1.269E+09	7.860E+00	1.40E+07	-2.84E+07	2.33E+07	-3.00E+00	5.00E-01	2	3.08672E+00		
15	2.549E+08	4.82E+00	7.62E+05	1.268E+09	7.861E+00	6.43E+07	-1.27E+08	2.72E+07	-2.50E+00	5.00E-01	2	3.08708E+00		
16	9.131E+08	3.45E+00	7.62E+05	1.268E+09	7.864E+00	2.68E+08	-5.29E+08	3.28E+07	-2.00E+00	5.00E-01	2	3.08829E+00		
17	2.962E+09	3.95E+00	7.61E+05	1.270E+09	7.874E+00	9.70E+08	-1.91E+09	1.34E+07	-1.50E+00	5.00E-01	2	3.09203E+00		
18	9.698E+09	-3.54E+01	7.59E+05	1.285E+09	7.904E+00	1.59E+09	-3.13E+09	-4.46E+07	-1.00E+00	5.00E-01	2	3.10396E+00		
19	2.959E+10	-9.15E+01	7.52E+05	1.410E+09	7.987E+00	1.57E+09	-3.12E+09	-7.05E+07	-5.00E-01	5.00E-01	2	3.13648E+00		
20	6.928E+10	-1.99E+02	7.36E+05	2.102E+09	8.119E+00	1.55E+09	-3.08E+09	1.44E+07	0.	5.00E-01	2	3.18823E+00		
21	1.259E+11	1.17E+03	7.07E+05	4.206E+09	8.233E+00	1.49E+09	-2.97E+09	5.00E+07	5.00E-01	5.00E-01	2	3.23305E+00		
22	1.633E+11	2.75E+03	6.59E+05	6.946E+09	8.232E+00	1.42E+09	-2.84E+09	4.70E+06	1.00E+00	5.00E-01	2	3.23258E+00		
23	1.969E+11	2.90E+03	5.94E+05	8.246E+09	8.292E+00	1.31E+09	-2.59E+09	-8.97E+07	1.50E+00	5.00E-01	2	3.25630E+00		
24	3.945E+11	-2.02E+03	5.22E+05	9.793E+10	5.266E+00	1.42E+09	-2.84E+09	0.	2.00E+00	5.00E-01	2	7.76055E-01	3	1.29176E+00
25	3.217E+11	-5.73E+03	3.51E+05	1.139E+11	4.040E+00	3.54E+09	-7.05E+09	1.36E+08	2.50E+00	5.00E-01	3	1.58655E+00		
26	1.097E+11	-2.49E+03	1.26E+05	3.892E+10	3.009E+00	3.56E+09	-7.05E+09	2.56E+08	3.00E+00	5.00E-01	3	1.18150E+00		
27	4.601E+09	-1.01E+02	1.42E+04	2.585E+09	2.324E+00	1.63E+09	-3.22E+09	5.57E+07	3.50E+00	5.00E-01	3	9.12701E-01		
28	4.333E+08	-1.94E+00	9.60E+02	7.867E+08	2.200E+00	2.12E+08	-4.20E+08	2.85E+06	4.00E+00	5.00E-01	3	8.66903E-01		
29	3.756E+07	-6.54E-02	9.17E+01	7.810E+08	2.201E+00	1.71E+07	-3.38E+07	1.15E+05	4.50E+00	5.00E-01	3	8.64157E-01		
30	4.183E+06	-1.27E-07	7.09E+00	7.810E+08	2.200E+00	1.41E+06	-2.79E+06	6.23E+03	5.00E+00	5.00E-01	3	8.63957E-01		
31	1.242E+06	0.	5.23E-01	7.810E+08	2.200E+00	1.03E+05	-2.04E+05	2.57E+02	5.50E+00	5.00E-01	3	8.63939E-01		
32	1.028E+06	0.	2.96E-02	7.810E+08	2.200E+00	6.61E+03	-1.30E+04	9.28E+00	6.00E+00	5.00E-01	3	8.63938E-01		
33	1.014E+06	0.	1.71E-11	7.810E+08	2.200E+00	2.21E+02	-4.38E+02	2.73E-08	6.50E+00	5.00E-01	3	8.63938E-01		
34	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	-2.94E-07	0.	7.00E+00	5.00E-01	3	8.63938E-01		
35	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	7.50E+00	5.00E-01	3	8.63938E-01		
36	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	8.00E+00	5.00E-01	3	8.63938E-01		
37	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	8.50E+00	5.00E-01	3	8.63938E-01		
38	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	9.00E+00	5.00E-01	3	8.63938E-01		
39	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	9.50E+00	5.00E-01	3	8.63938E-01		
40	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	1.00E+01	5.00E-01	3	8.63938E-01		

ENERGY MAP

1 2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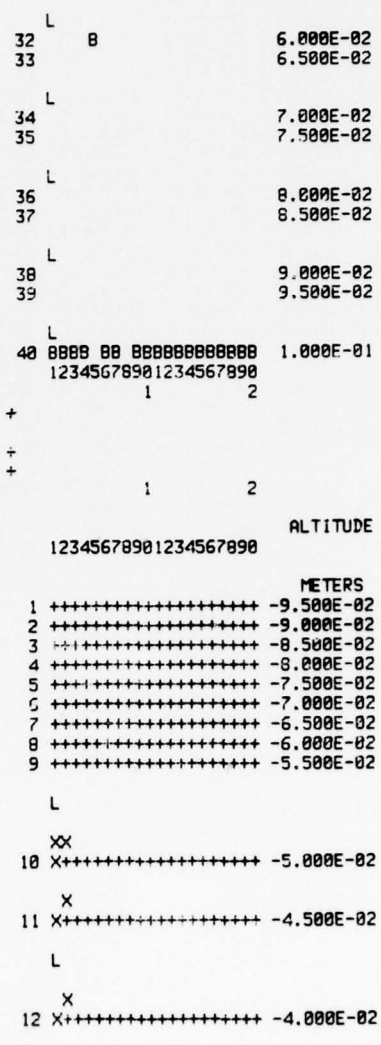
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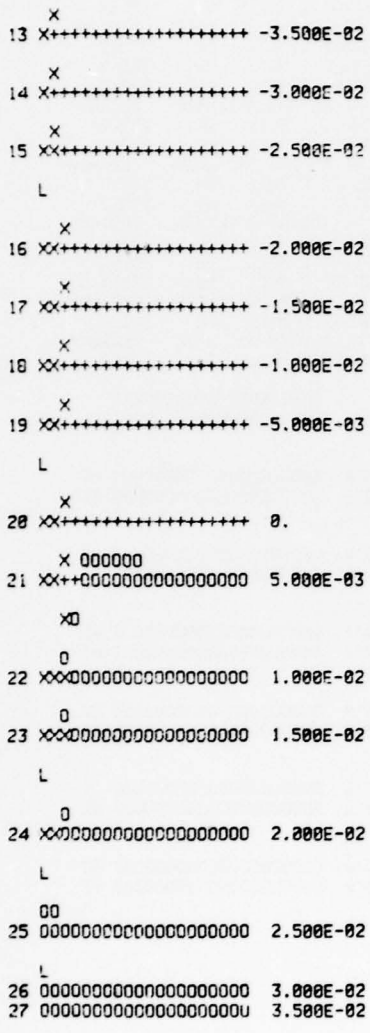
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250

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   CYCLE    92   TIME 3.0311E-06  DT 3.426E-08   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   2.8657447E+07 XI(N+1)=  -5.2060697E+06 KE(N+1)=   4.2169524E+05
   CYCLE    93   TIME 3.0654E-06  DT 3.204E-08   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   1.6155761E+07 XI(N+1)=  -1.2117377E+07 KE(N+1)=   6.6420284E+05
   CYCLE    94   TIME 3.0974E-06  DT 2.998E-08   IDT    2  JDT   20
   CYCLE    95   TIME 3.1274E-06  DT 3.299E-08   IDT    2  JDT   20
   CYCLE    96   TIME 3.1604E-06  DT 3.630E-08   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   1.8707426E+07 XI(N+1)=  -1.3583035E+07 KE(N+1)=   5.5783286E+05
   CYCLE    97   TIME 3.1967E-06  DT 3.396E-08   IDT    2  JDT   20
   CYCLE    98   TIME 3.2307E-06  DT 3.737E-08   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   1.5451507E+07 XI(N+1)=  -1.2906510E+07 KE(N+1)=   8.5292303E+05
   CYCLE    99   TIME 3.2680E-06  DT 3.496E-08   IDT    2  JDT   20
   CYCLE   100   TIME 3.3030E-06  DT 3.847E-08   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   1 J   4 XI(N)=   2.0108496E+07 XI(N+1)=  -1.0389636E+07 KE(N+1)=   6.8755649E+05
   CYCLE   101   TIME 3.3415E-06  DT 3.599E-08   IDT    2  JDT   20
   CYCLE   102   TIME 3.3775E-06  DT 3.961E-08   IDT    2  JDT   20
   CYCLE   103   TIME 3.4171E-06  DT 4.359E-08   IDT    2  JDT   20
**HYDRO - NEGATIVE ENERGY IN I   2 J   4 XI(N)=   2.5934629E+07 XI(N+1)=  -1.9608122E+06 KE(N+1)=   9.3026498E+05
   CYCLE   104   TIME 3.4607E-06  DT 4.797E-08   IDT    2  JDT   20
+
**********
*        *
* CSTOP  *
*        *
**********
+
+
```

```
**********
**********
+
PROB    1.3000     CYCLE   104     TIME  3.460653E-06     DT  4.797493E-08
+
*
+
     INTERNAL ENERGY          KINETIC ENERGY          TOTAL ENERGY              ETH                  REL ERROR
   1.030670527377 24E+13    5.217893064442 35E+13    6.248563591819 57E+13    6.247996844299 07E+13    1.903536098128 82E+01
+
                                                      TOTAL MASS                MTH                  RELMERR
                                                    6.438444337833 03E+03    6.438444337831 52E+03    7.850275849530 87E-08
+
MAX VEL =  7.61989E+05 AT I   2 J  13
+
MAX CS =   6.54966E+05 AT I   2 J  25
+
MAX TEMP=   1.84890E+04 AT I   3 J  21
+
MAX P =   4.00522E+11 AT I   2 J  25
+
CELL SETTING DT. I   2 J  20
+
+
TOTAL TIME FOR THIS PROBLEM     0 HOURS,  0 MIN, 39 SEC
                  OF THIS       0 HOURS,  0 MIN,  0 SEC IS 6600 TIME.
                     AND        0 HOURS,  0 MIN, 39 SEC IS 7600/176 TIME.
+
TIME FOR THIS RUN     0 HOURS,  1 MIN,  5 SEC
+
WHIZ FACTOR TOTAL PROBLEM   = 4.77E-04 SEC/CELL/CYCLE
+
WHIZ FACTOR SINCE LAST DUMP = 4.35E-04 SEC/CELL/CYCLE
+
+
+
+
I=   1  X(I)=      .500   DX(I)=     .500
+
 J       P         U         V         XI        RHO       SRR       SZZ       SRZ        Y        DY    M      XM     M      XM
+
  1  1.813E+06  0.        0.       2.044E+09 1.225E-03  0.       0.       0.       -9.50E+00 5.00E-01 1 4.81056E-04
  2  1.805E+06 -3.68E-06  5.16E+00 2.039E+09 1.218E-03  0.       0.       0.       -9.00E+00 5.00E-01 1 4.70252E-04
  3  1.807E+06 -2.27E-02  3.97E+03 2.039E+09 1.220E-03  0.       0.       0.       -8.50E+00 5.00E-01 1 4.79199E-04
  4  1.613E+03  1.30E+00 -8.51E+02 2.259E+07 1.717E-04  0.       0.       0.       -8.00E+00 5.00E-01 1 6.74325E-05
  5  1.231E+06  7.95E+01  2.05E+05 4.747E+10 1.123E-04  0.       0.       0.       -7.50E+00 5.00E-01 1 4.41007E-05
  6  1.939E+06  2.56E+01  3.91E+05 6.820E+10 1.380E-04  0.       0.       0.       -7.00E+00 5.00E-01 1 5.41748E-05
  7  2.739E+06 -2.40E+01  5.44E+05 7.245E+10 1.831E-04  0.       0.       0.       -6.50E+00 5.00E-01 1 7.19018E-05
  8  3.492E+06 -2.88E+01  6.61E+05 6.[illegible]E+10 2.392E-04  0.       0.       0.       -6.00E+00 5.00E-01 1 [illegible]E-05
  9  4.165E+06 -4.23E+00  7.43E+05 6.[illegible]E+10 2.933E-04  0.       0.       0.       -5.50E+00 5.00E-01 1 1.[illegible]E-04
 10  4.286E+06  7.40E+00  7.62E+05 1.279E+09 5.708E+00 -1.63E+07  3.46E+07  0.       -5.00E+00 5.00E-01 1 3.26585E-05 2 2.24161E+00
 11 -1.525E+07  6.21E+00  7.62E+05 1.276E+09 7.859E+00 -1.53E+07  3.25E+07  2.97E+06 -4.50E+00 5.00E-01 2 3.08639E+00
 12 -1.690E+07  5.35E+00  7.62E+05 1.273E+09 7.860E+00 -1.23E+07  2.59E+07  1.00E+07 -4.00E+00 5.00E-01 2 3.08646E+00
 13  1.675E+06  5.41E+00  7.62E+05 1.271E+09 7.860E+00 -4.48E+06  9.61E+06  1.80E+07 -3.50E+00 5.00E-01 2 3.08654E+00
```

14	7.719E+07	5.83E+00	7.62E+05	1.270E+09	7.960E+00	1.85E+07	-3.67E+07	2.47E+07	-3.00E+00	5.00E-01	2	3.08672E+00
15	3.220E+08	5.23E+00	7.62E+05	1.269E+09	7.861E+00	9.03E+07	-1.79E+08	2.81E+07	-2.50E+00	5.00E-01	2	3.08719E+00
16	1.009E+09	2.74E+00	7.62E+05	1.269E+09	7.865E+00	3.20E+08	-6.47E+08	2.65E+07	-2.00E+00	5.00E-01	2	3.08846E+00
17	3.000E+09	7.99E-01	7.61E+05	1.270E+09	7.874E+00	1.10E+09	-2.16E+09	-1.15E+07	-1.50E+00	5.00E-01	2	3.09209E+00
18	8.754E+09	-4.53E+01	7.59E+05	1.283E+09	7.900E+00	1.59E+09	-3.12E+09	-6.87E+07	-1.00E+00	5.00E-01	2	3.10229E+00
19	2.321E+10	-8.64E+01	7.54E+05	1.373E+09	7.961E+00	1.58E+09	-3.12E+09	-8.05E+07	-5.00E-01	5.00E-01	2	3.12610E+00
20	4.806E+10	-1.06E+02	7.42E+05	1.816E+09	8.044E+00	1.56E+09	-3.10E+09	2.08E+07	0.	5.00E-01	2	3.15903E+00
21	7.920E+10	1.29E+03	7.20E+05	3.220E+09	8.097E+00	1.51E+09	-3.02E+09	1.18E+08	5.00E-01	5.00E-01	2	3.17950E+00
22	1.052E+11	4.19E+03	6.83E+05	5.732E+09	8.080E+00	1.44E+09	-2.89E+09	6.81E+07	1.00E+00	5.00E-01	2	3.17318E+00
23	1.120E+11	5.56E+03	6.21E+05	8.177E+09	7.953E+00	1.19E+09	-2.36E+09	-4.23E+07	1.50E+00	5.00E-01	2	3.12328E+00
24	2.207E+11	3.10E+03	5.55E+05	3.770E+10	6.641E+00	1.35E+09	-2.68E+09	0.	2.00E+00	5.00E-01	2	2.06204E+00 3 5.45817E-0
25	3.580E+11	-6.11E+03	4.33E+05	1.308E+11	4.133E+00	3.53E+09	-7.05E+09	-5.53E+07	2.50E+00	5.00E-01	3	1.62320E+00
26	1.959E+11	-5.56E+03	2.46E+05	7.607E+10	3.614E+00	3.56E+09	-7.05E+09	2.67E+08	3.00E+00	5.00E-01	3	1.41935E+00
27	2.186E+10	-1.06E+03	6.34E+04	1.486E+10	2.644E+00	3.59E+09	-7.05E+09	2.61E+08	3.50E+00	5.00E-01	3	1.03849E+00
28	1.975E+09	-4.91E+01	4.89E+03	1.035E+09	2.251E+00	7.44E+08	-1.47E+09	2.28E+07	4.00E+00	5.00E-01	3	8.83046E-01
29	2.051E+08	-1.91E+00	4.50E+02	7.817E+08	2.203E+00	9.48E+07	-1.86E+08	1.98E+06	4.50E+00	5.00E-01	3	8.65164E-01
30	2.092E+07	-4.78E-02	4.37E+01	7.810E+08	2.200E+00	8.68E+06	-1.71E+07	9.41E+04	5.00E+00	5.00E-01	3	8.64052E-01
31	2.675E+06	-9.91E-08	3.87E+00	7.810E+08	2.200E+00	7.42E+05	-1.46E+06	5.13E+03	5.50E+00	5.00E-01	3	8.63948E-01
32	1.151E+06	0.	2.99E-01	7.810E+08	2.200E+00	6.00E+04	-1.18E+05	2.61E+02	6.00E+00	5.00E-01	3	8.63939E-01
33	1.023E+06	0.	1.77E-02	7.810E+08	2.200E+00	4.02E+03	-7.86E+03	7.84E+00	6.50E+00	5.00E-01	3	8.63938E-01
34	1.014E+06	0.	1.36E-11	7.810E+08	2.200E+00	1.25E+02	-2.50E+02	1.66E-08	7.00E+00	5.00E-01	3	8.63938E-01
35	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	-1.32E-07	0.	7.50E+00	5.00E-01	3	8.63938E-01
36	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	8.00E+00	5.00E-01	3	8.63938E-01
37	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	8.50E+00	5.00E-01	3	8.63938E-01
38	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	9.00E+00	5.00E-01	3	8.63938E-01
39	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	9.50E+00	5.00E-01	3	8.63938E-01
40	1.013E+06	0.	0.	7.810E+08	2.200E+00	0.	0.	0.	1.00E+01	5.00E-01	3	8.63938E-01

ENERGY MAP

```
          1         2

                                ALTITUDE
   12345678901234567890

                                 METERS
 1                            -9.500E-02
 2                            -9.000E-02
 3 BBBBB                      -8.500E-02
 4 TTTTT                      -8.000E-02
 5 BBBBBBB                    -7.500E-02
 6    TTTT                    -7.000E-02
 7   T                        -6.500E-02
 8 TT                         -6.000E-02
 9                            -5.500E-02
10                            -5.000E-02

  L
11    B                      -4.500E-02
12   B B                     -4.000E-02

  L
13                           -3.500E-02
```

```
14       B                -3.000E-02
15        B               -2.500E-02
16         B              -2.000E-02

   L
17 BBT                    -1.500E-02
18          B             -1.000E-02
19    TTTT  B             -5.000E-03
20    BB  TTT              0.

   L
21   BTT                   5.000E-03
22   TBBBBBBBBBB           1.000E-02
23   BT TTTTTTTT           1.500E-02

   L
24     T                   2.000E-02

   L
25   T                     2.500E-02

   L
26 TT                      3.000E-02
27                         3.500E-02

   L
28                         4.000E-02
29                         4.500E-02

   L
30         B               5.000E-02
31                         5.500E-02

   L
32                         6.000E-02
33      B                  6.500E-02

   L
34                         7.000E-02
35                         7.500E-02

   L
36                         8.000E-02
37                         8.500E-02

   L
38                         9.000E-02
39                         9.500E-02

   L
40 BBBB BB BBBBBBBBBBB     1.000E-01
   12345678901234567890
            1         2
+
```

MATERIAL MAP

```
+
+
          1         2

                              ALTITUDE
   12345678901234567890

                               METERS
 1 ++++++++++++++++++++ -9.500E-02
 2 ++++++++++++++++++++ -9.000E-02
 3 ++++++++++++++++++++ -8.500E-02
 4 ++++++++++++++++++++ -8.000E-02
 5 ++++++++++++++++++++ -7.500E-02
 6 ++++++++++++++++++++ -7.000E-02
 7 ++++++++++++++++++++ -6.500E-02
 8 ++++++++++++++++++++ -6.000E-02
 9 ++++++++++++++++++++ -5.500E-02
10 ++++++++++++++++++++ -5.000E-02

   L

   XX
11 X++++++++++++++++++++ -4.500E-02

    X
12 X++++++++++++++++++++ -4.000E-02

   L

    X
13 X++++++++++++++++++++ -3.500E-02

    X
14 XX+++++++++++++++++++ -3.000E-02

    X
15 XX+++++++++++++++++++ -2.500E-02

    X
16 XX+++++++++++++++++++ -2.000E-02

   L

    X
17 XX+++++++++++++++++++ -1.500E-02

    X
18 XX+++++++++++++++++++ -1.000E-02

    X
19 XX++++++++++++++++++++ -5.000E-03

    X
```

```
20 XX++++++++++++++++++  0.

   L

     X 0000000
21 XX++0000000000000000  5.000E-03

     XO
22 XX+00000000000000000  1.000E-02

      X

      O
23 XXXO0000000000000000  1.500E-02

   L

      O
24 XXXO0000000000000000  2.000E-02

   L

   OOO
25 OXOOOOOOOOOOOOOOOOO  2.500E-02

   L
254
    O
26 OOOOOOOOOOOOOOOOOOO  3.000E-02
27 OOOOOOOOOOOOOOOOOOO  3.500E-02

   L
28 OOOOOOOOOOOOOOOOOOO  4.000E-02
29 OOOOOOOOOOOOOOOOOOO  4.500E-02

   L
30 OOOOOOOOOOOOOOOOOOO  5.000E-02
31 OOOOOOOOOOOOOOOOOOO  5.500E-02

   L
32 OOOOOOOOOOOOOOOOOOO  6.000E-02
33 OOOOOOOOOOOOOOOOOOO  6.500E-02

   L
34 OOOOOOOOOOOOOOOOOOO  7.000E-02
35 OOOOOOOOOOOOOOOOOOO  7.500E-02

   L
36 OOOOOOOOOOOOOOOOOOO  8.000E-02
37 OOOOOOOOOOOOOOOOOOO  8.500E-02

   L
38 OOOOOOOOOOOOOOOOOOO  9.000E-02
39 OOOOOOOOOOOOOOOOOOO  9.500E-02

   L
 40 OOOOOOOOOOOOOOOOOOO  1.000E-01
    12345678901234567890
              1         2
+
ZALK
    PROB            1.300000000000000E+00    1720514631463146 3
    ATMOS           5.000000000000060E+00    1722500000000000000
    BREF            0.                       0900000000000000000
    CODE            1.000000000300090E+00    1720400000000000000
    COLD            0.                       7777777777777777776
    CYCLE           1.040000000000000E+02    1726640000000000000
    DIMEN           2.000000000000000E+00    1721400000000000000
    DT              4.79749336958573E-00     1667634063772604025 2
    ELC             6.248563591819570E+13    1775706511104172271 7
    EOS             6.000000000000000E+00    1722600000000000000
    ETH             6.247996844299870E+13    1775706464812306467 3
    EXPAND          5.000000000000000E-02    1713631463146314631 5
    FAIL            0.                       0000000000000000000
    FLUXER          3.000000000000000E+00    1721600000000000000
    GEOM            2.000000000000000E+00    1721400000000000000
    IMAX            2.000000000000000E+01    1724500000000000000
    IQ              1.900000000000000E+01    1724460000000000000
    ISLAND          0.                       0000000000000000000
    JMAX            4.000000000000060E+01    1725500000000000000
    JQ              3.900000000000000E+01    1725470000000000000
    HOB             0.                       0000000000000000000
    LREF            9.                       7777777777777777776
    METHOD          2.000000000000000E+00    1721400000000000000
    MLC             6.438444337833030E+03    1734623316160017715 2
    MTH             6.438444337831520E+03    1734623316160017706 6
    NH              2.000000000000000E+01    1724500000000000000
    NHIC            1.600000000000000E+03    1732620000000000000
    NHIST           6.000000000000000E+00    1722600000000000000
    NM              3.000000000000000E+00    1721600000000000000
    NOP             1.500000000000000E+01    1724480000000000000
    NPP             2.000000000000000E+00    1721480000000000000
    NROWPB          4.000000000000000E+00    1722400000000000000
    NSTN            1.600000000000000E+01    1724480000000000000
    NVARST          1.500000000000000E+01    1723740000000000000
    PTSTOP          6.000000000000000E+02    1731454000000000000
    RADLOS          0.                       0000000000000000000
    REZONE          0.                       0000000000000000000
    RREF            0.                       0000000000000000000
    STABF           5.000000000000000E-01    1717480000000000000
    STRAIN          1.000000000000000E+00    1720400000000000000
    STRESS          1.000000000000000E+00    1720400000000000000
    SUME            0.                       0000000000000000000
    T               3.460653394400955E-06    1675720366224546053 5
    TERAD           0.                       0000000000000000000
    TLC             3.460653394400955E-06    1675720366224546053 5
    TRLC            0.                       0000000000000000000
    TIME            3.971199399999995E+01    1725475544264162540 0
```

```
TTIME6          0.                        00000000000000000000
TTIME7          3.97119999999995E+01      17254755442641625400
TTSTOP          1.00000000000000E+02      17266200000000000000
UREZ            1.00000000000000E+01      17235000000000000000
VISC            0.                        00000000000000000000
VREZ            1.00000000000000E+01      17235000000000000000
VOIDS           0.                        00000000000000000000
WORK            0.                        00000000000000000000
X1              4.00000000000000E+00      17224000000000000000
X2             -1.00000000000000E+00      60573777777777777777
XOB             0.                        00000000000000000000
Y1              8.00000000000000E+00      17234000000000000000
Y2              3.20000000000000E+01      17254000000000000000
YGND            0.                        00000000000000000000
YIELD           0.                        00000000000000000000
AIR             1.00000000000000E+00      17204000000000000000
FE              2.00000000000000E+00      17214000000000000000
CONCRT          3.00000000000000E+00      17216000000000000000
STAPE           1.02094870487300-196      05053641555555551031
                0.                        00000000000000000000
                0.                        00000000000000000000
                0.                        00000000000000000000
                0.                        00000000000000000000
                0.                        00000000000000000000
                0.                        00000000000000000000
                0.                        00000000000000000000
                0.                        00000000000000000000
                0.                        00000000000000000000
                0.                        00000000000000000000
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                0.                        00000000000000000000
                0.                        00000000000000000000
                0.                        00000000000000000000
                0.                        00000000000000000000
                0.                        00000000000000000000
                0.                        00000000000000000000
                0.                        00000000000000000000
```

```
 MFX   NOS/BE 1.2    KAFB  011 MFX   07/10/78
 FLCM=314000 MXCM=250000 FLEC=1720K  MXEC=0600K
+
14.52.48.GABY31X  FROM MX2/IS
14.52.48.IP  00000320 WORDS - FILE INPUT  . DC 04
14.52.48.GABY3,T377,NT1,MT1.
14.52.51.ACCOUNT,GABY,*********-***,DYP.
14.52.53.SYSBULL(BATCH)
14.52.54.ATTACH,HULLIB,ID=DYMXCER.
14.52.54.PFN IS
14.52.54.HULLIB
14.52.55.PF CYCLE NO. = 039
14.52.55.LIBRARY,HULLIB.
14.52.55.SWITCH,6.
14.52.55.SWITCH,3.
14.52.56.HULLR.
14.53.22.RECOVERED RMS ERROR
14.53.22.COPYCR(LOCAL,HHH)
14.53.24.RETURN(LOCAL)
14.53.29.IFE,FILE(CHANGES,IN),CPR.
14.53.30.ENDIF,CPR.
14.53.30.IFE,FILE(CHANGES,AS.AND..NOT.IN),CPY.
14.53.32.ENDIF,CPY.
14.53.32.GETC,HHH.
14.53.35.ATTACH(XXX,CH105,ID=DYMXCER)
14.53.38.PF CYCLE NO. = 014
14.53.38.COPYCR(XXX,HHH)
14.53.39.RETURN(XXX)
14.53.40.REVERT.
14.53.42.CONTR,BOW.
14.53.54.     END  CNT
14.53.54.FILE(TAPE10,SBF=NO)
14.54.01.FILE(TAPE11,SBF=NO)
14.54.02.FILE(TAPE41,SBF=NO)
14.54.03.FILE(TAPE42,SBF=NO)
14.54.04.LDSET(FILES=TAPE10/TAPE11/TAPE41/TAPE42)
14.54.05.BOW.
14.54.06.REQUEST(TAPE10,*PF)
14.54.06.REQUEST(TAPE42,*PF)
14.54.12.STERN, PROBLEM     1.1200 UPDATED.
14.56.10.CT ID=  DYMXCER PFN=DYMASTLIBRARY
14.56.10.CT CY= 002  00040064 WORDS.
14.56.11.EX ID=  DYMXCER PFN=DYMASTLIBRARY
14.56.11.EX CY= 001  00000000 WORDS.
14.56.11.EX ID=  DYMXCER PFN=DYMASTLIBRARY
14.56.11.EX CY= 001  00000000 WORDS.
14.56.57.EX ID=  DYMXCER PFN=DYMASTLIBRARY
14.56.57.EX CY= 001  00040064 WORDS.
14.56.58.PR ID=  DYMXCER PFN=DYMASTLIBRARY
14.56.58.PR CY= 002  00040064 WORDS.
14.56.58.REQUEST(TAPE42,*PF)
14.56.59.PR ID=  DYMXCER PFN=PROBLEMMASTAPE41INFO1P1200
14.56.59.PR CY= 001  00000512 WORDS.
14.57.01.STERN   10 RESOURCE TAPES REMAINING
14.57.39.HULL     8 RESOURCE TAPES REMAINING
14.58.21.CT ID=  DYMXCER PFN=DYMASTLIBRARY
14.58.21.CT CY= 002  00040128 WORDS.
14.58.37.EX ID=  DYMXCER PFN=DYMASTLIBRARY
14.58.37.EX CY= 001  00000000 WORDS.
14.59.40.EX ID=  DYMXCER PFN=DYMASTLIBRARY
14.59.40.EX CY= 001  00040128 WORDS.
14.59.52.PR ID=  DYMXCER PFN=DYMASTLIBRARY
14.59.52.PR CY= 002  00040128 WORDS.
15.00.28.NEED IK110 EE36  ED91  GK73
15.01.19.REQUEST(TAPE4,*NT,PE,RING,U,E,VSN=0IK110)
15.01.19.( NT 066 ASSIGNED)
15.01.19.NT66 VOLUME SERIAL NUMBER IS  0IK110
15.01.20.     END  BOW
15.01.20.CONTR,PLANK.
15.01.25.     END  CNT
15.01.25.FILE(TAPE4,SBF=NO)
15.01.26.FILE(TAPE41,SBF=NO)
15.01.27.LDSET(FILES=TAPE4/TAPE41)
15.01.27.PLANK.
15.01.34.GENERATING HULL     DISK        VERSION
15.01.36.     END  PLANK
15.01.36.CONTR,SAIL.
15.01.39.     END  CNT
15.01.39.DYMAST(I=HHH)
15.03.35.   10317  CARDS GENERATED
15.03.35.  END OF  NORMAL     RUN
15.03.35.  SYSTEM  HULL       VERSION  105
15.04.16.  EXIT
15.04.16.RETURN(HHH)
15.04.17.RETURN(SAVE)
15.04.19.REQUEST(SAVE,*Q)
15.04.20.CONTR,COMPILE.
15.04.28.     END  CNT
15.04.28.IFE,R2.EQ.2,COMPS.
15.04.28.ELSE,COMPS.
15.04.28.FTN(A,I=SAIL,PL=1000000,B=HULL,OPT=2,L=S
15.04.28.AVE)
15.06.59.     8.553 CP SECONDS COMPILATION TIME
15.06.59.ENDIF,COMPS.
15.07.00.RETURN(SAIL,LOCAL)
15.07.00.IFE,R2.NE.0,MET.
15.07.01.ENDIF,MET.
15.07.01.RETURN(MAP)
15.07.02.REQUEST(MAP,*Q)
15.07.03.CONTR,LOAD.
15.07.06.     END  CNT
15.07.06.IFE,R2.EQ.2,RUNS.
15.07.07.ELSE,RUNS.
15.07.07.IFE,R1.NE.0,H17G.
15.07.08.HULE17G,COMMENT.
15.07.09.FILE(TAPE4,SBF=NO)
15.07.10.FILE(TAPE41,SBF=NO)
15.07.11.FILE(TAPE9,SBF=NO)
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15.07.11.FILE(TAPE40,SBF=NO)
15.07.12.FILE(TAPE10,SBF=NO)
15.07.13.FILE(TAPE44,SBF=NO)
15.07.13.FILE(TAPE45,SBF=NO)
15.07.14.LDSET(PRESETA=NGINDEF,MAP=SBEX/MAP)
15.07.14.LDSET(FILES=TAPE4/TAPE41/TAPE9/TAPE40/TA
15.07.14.PE10)
15.07.14.LDSET(FILES=TAPE44/TAPE45)
15.07.14.HULL.
15.08.12.REQUEST(TAPE9,*MT,HY,RING,IU,U,E,VSN=00EE36)
15.08.12.( MT 052 ASSIGNED)
15.08.18.MT52 VOLUME SERIAL NUMBER IS  00EE36
15.08.29.LOCKIN.
15.08.38.MT52  BLOCKS WRITTEN -000007
15.08.42.NT66  BLOCKS WRITTEN -000091
15.08.43.REQUEST(TAPE41,*PF)
15.08.57.MT52  BLOCKS WRITTEN -000009
15.09.09.MT52  BLOCKS WRITTEN -000011
15.09.21.MT52  BLOCKS WRITTEN -000013
15.09.47.MT52  BLOCKS WRITTEN -000015
15.10.13.MT52  BLOCKS WRITTEN -000017
15.10.25.NT66  BLOCKS WRITTEN -000135
15.10.25.REQUEST(TAPE41,*PF)
15.10.29.MT52  BLOCKS WRITTEN -000019
15.10.50.MT52  BLOCKS WRITTEN -000021
15.12.00.MT52  BLOCKS WRITTEN -000023
15.12.59.MT52  BLOCKS WRITTEN -000025
15.13.32.MT52  BLOCKS WRITTEN -000027
15.13.41.MT52  BLOCKS WRITTEN -000029
15.14.05.MT52  BLOCKS WRITTEN -000031
15.14.18.MT52  BLOCKS WRITTEN -000033
15.14.38.MT52  BLOCKS WRITTEN -000035
15.14.47.NT66  BLOCKS WRITTEN -000179
15.14.48.REQUEST(TAPE41,*PF)
15.15.00.MT52  BLOCKS WRITTEN -000037
15.15.10.MT52  BLOCKS WRITTEN -000039
15.15.17.****** TOTAL CYCLE STOP.
15.15.21.NT66  BLOCKS WRITTEN -000223
15.15.22.MT52  BLOCKS WRITTEN -000041
15.15.22.REQUEST(TAPE41,*PF)
15.15.24.CT ID=  DYMXCER PFN=PROBLEMMASTAPE41INFO1P3000
15.15.24.CT CY= 001  00000640 WORDS.
15.15.27.     END  HULL
15.15.27.    40.346 CP SECONDS EXECUTION TIME
15.15.27.RETURN(TAPE4,HULL)
15.15.27.REVERT.
15.15.28.ELSE,H176.
15.15.29.ENDIF,H176.
15.15.29.ENDIF,RUNS.
15.15.30.ACCOUN.
15.15.47.UNLOCK,EXP.
15.15.48.ACCOUNT FILE = ACCOUNTKJ2BV10F5P8
15.15.48.  ACCOUNT ID = DYMXCER
15.16.00.     END  ACCNT
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257/258

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15.16.00.REVERT.
15.16.02.OP  09007744 WORDS - FILE FILMPR , DC 20
15.16.02.OP  00010560 WORDS - FILE OUTPUT , DC 40
 5.15.02.MS   21504  WORDS  (  306176 MAX USED)
.5.15.02.CPA      65.986 SEC.        65.985 ADJ.
15.16.02.IO      180.973 SEC.        45.243 ADJ.
15.16.02.CM    6347.696 KWS.         26.635 ADJ.
15.16.02.SS                         137.864
15.16.02.PP      497.763 SEC.      DATE 08/21/79
15.16.02.COST ESTIMATE              $23.16
15.16.02.EJ  END OF JOB, IS
```